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# American Medicine

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GEORGE M. GOULD, *Editor*

G. C. C. HOWARD, *Managing Editor*

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In Advance.

**The national food and drugs act** which was passed by Congress last session, is another step in the preservation of public health, and a big one, too. It prohibits harmful adulteration absolutely, but if mixtures are harmless, they may be sold provided the label states what they really are. Advance in civilization depends upon the inventors and they must be protected or there will be no incentive to build up trade based on new ideas. As a matter of public policy, justice, and common sense, the makers of proprietary foods, therefore, are not required to divulge their formulas, but only enough information to show that there is neither adulteration or misbranding.

**Coloring matters are prohibited if they conceal inferiority**, but if such a "blend" is properly labeled and is harmless it is permissible. Many people believe that white butter is inferior but they are cheated into buying it at high prices when its inferiority is concealed by yellow coloring matter. Such practices of the "honest farmer" are now punishable. Confectionery likewise must not contain terra alba, barytes, talc, chrome yellow, or anything else for color or flavor if it is injurious to health. A great mistake was made in not directing the labeling of the date of manufacture, but public opinion may compel this change in the law—at least we hope so. As we have before explained, the makers who do so will have a great trade advantage.

**Pure drug requirements** are very drastic and properly so. Each article must conform to the Pharmacopeial or National Formulary standards or be properly labeled if it differs from the standard. In the case of both food and drug mixtures, the label must clearly state the proportion, if any, of alcohol, morphin, opium, cocain, heroin, alpha or beta eucain, chloroform, cannabis indica, chloral hydrate, or acetanilid. This should kill the worst of the quack mixtures. In short, the law has so many provisions that it is now practically impossible to be deceived by reading the label on the package—indeed any such deception, though not specifically forbidden, is illegal. It is not lawful even to imitate another drug or food unless so labeled. The trade liars are to have a thorny pathway and should have had it years ago. It sounds like the millennium, but we are afraid a few rascals will find some loop-holes unless constantly watched.

**The dreadful defect of the law** is so immoral that it is really a national disgrace. It is permissible to make anything for export—no matter how filthy or dangerous or fraudulent—if a foreign buyer orders it and it is not in conflict with the laws of the country to which it is sent. If a Chinese merchant wants cheap canned beef made from diseased cattle, he may have it, for China has no laws on this subject, so far as we know. If another man wants sausages made of dogs, he can get them here, if dogs

are eaten in his country. We have published to the world that we will do anything, no matter how low, if there is a demand for it and there's money in it. There is no longer any necessity for the destruction of tuberculous or lumpy-jawed cattle for they may be exported as food wherever required. This will add a cent or two a pound to the profits of the packer, and though it may jeopardize his chances of heaven, he doesn't care for that if he gets the extra penny to use here.

**The defect is a surrender to the criminal business element,** indeed a worse one is not found in the history of American legislation. We cannot imagine what Congress was dreaming about when it informed the world that we are a race of scoundrels low enough to do anything for money. They should repeal this proviso of the second section, at once, and tell the whole world we are honest, that American exports are correctly labeled with contents and date, and that we never send out anything filthy, diseased, or harmful, even though some savages or barbarians may demand it. Let it be known that we wish to lift the moral tone of the world and not make money by lowering it, and that American goods do not need examination or testing, for they are safe and sound and exactly what the label says they are. So far as we know, this is the only law on the statute books which legalizes gross immorality. It actually pollutes the whole law which otherwise is in the interest of the highest morality. Moreover, it ties the hands of local Health Boards in routing out disgusting practices, for they cannot interfere with interstate or foreign commerce.

**The damage to our export trade** is enormous and will continue a long time, unless we compel decency. Mr. James Cantlie,

M.B., F. R. C. S., and editor of the *Journal of Tropical Medicine*, says in that journal of October 15, 1906,—"Lately the American canned goods scandals have shaken the confidence of the public in all kinds of preserved foods. What was going on in American canning factories was well known to manufacturers of food products in this country, to all medical men, and to all who cared to listen to what was said and written. The warnings were disregarded, and British manufacturers were eclipsed in the market; now, perhaps, people will patronize the products of their own countrymen where the materials used can be inspected, and the process of preparation watched. That British producers of foods of this description have taken infinite pains to insure cleanliness of premises and wholesomeness of materials, is well known, and we look forward to still further improvement in this important department of food supply."

**English food scandals** are as bad as ours, only less talked about and less evident because of the small size of the business. Mr. Cantlie's pecksniffian remarks are amusing in view of the real facts. Indeed it is reported (*British Medical Journal*, October 6, 1906) that at the opening session of the English Royal Veterinary College, one speaker said, "it was remarkable that the man in the street, who held up his hands in pious horror at Chicago, appeared utterly unconscious that in this country, excepting a few enlightened cities and towns, there were no regular systems of meat inspection at all," and that diseased cattle were sold as an every day occurrence. Mr. Cantlie's warning will be disregarded to some extent, as England depends upon America for about half of her food, yet it shows that distrust will be fostered to build up home industries. To fight such arguments, American goods

must be above suspicion. Germany, though suffering from a meat famine, stoops to the same hypocrisy in excluding our meats to protect her farmers, for in less than two months in 1906, there were 695 convictions reported in that country for selling rotten meat.

[ **State and municipal laws** are now needed, as the national law does not apply to making, transporting, or selling within any State. Its provisions are constitutionally limited to the territories, imports, exports, and interstate commerce. New York city we believe has taken the lead, and every other municipality and State must quickly follow. It is merely necessary to copy the provisions of the national law and make them operative within the local jurisdiction. The regulations made by the Secretaries of Commerce, Agriculture, and the Treasury, explanatory of the law and to execute it, should also be the basis for similar regulations of local health authorities.

**The variation of botanical drugs** has been brought up to introduce another disturbing factor into the much vexed pharmacopeia question. It is well known that variation is the rule and not the exception—no two individuals of any species of plant or animal are exactly alike. Similarly the amount of the active ingredient or alkaloid is not supposed to be the same in any two trade samples—exact likeness is supernatural. The dose administered is never exact to the ten-thousandth of a grain, or even in some cases to the tenth of a grain. It is of no practical importance whether we give 9.5 grains of quinin or 10 grains, for no one can tell whether they act differently. Drugs are administered according to body-weight, anyhow, and yet the personal idiosyncrasy or effect of youth and age may disturb all

calculations. Doses, then, are stated within certain maximum and minimum limits and the variation of the pharmacopeial preparations is too small to be of any therapeutic importance.

**Inert drugs** from botanical sources are serious matters which demand investigation. It is now claimed that differences of climate, soil, seasons, or methods of cultivation or harvesting, may exaggerate natural variations to such a degree as to eliminate the active principle, and that a preparation made from crude drugs may be strictly official and yet be inert and worthless. The charge is so disconcerting that it must be hoped it is grossly exaggerated. One feels the very foundations slipping away if old tried standards are found to be delusive after all. It is a strange commentary upon the inexactness of therapeutics that such a statement could even be made. By all means let the charge be investigated and promptly denied if false. If it is even in part true, new standards of drugs are needed at once whether they are official or not.

**The Pharmacopeia and National Formulary are now the law of the land** and their standards must be followed unless the label specifically states the difference. This is the great medical revolution made by the new pure food law. It behooves everyone to have respect for the Pharmacopeia now, even if he never had any before. The general government must take a hand in the making of these standards in the future revisions of the Pharmacopeia. This is not revolutionary, by-the-way, but the invariable rule. A few people originate something for their convenience—say a measure of length—but in time it is found that there are several and that the people as a whole must fix a standard, and they call it a yard or

inch. They cannot be forced by a small minority to use an impractical standard, and they cannot be forced to use a pharmacopeia unless it is suitable.

**Pharmacopeial revisions must voice usage**, but let us keep in advance of the pharmacopeia in our practice, using the new if better, and never boast of our unprogressiveness by saying we are so far behind the times that we use nothing except what is in a pharmacopeia ten years old. It has been suggested, by-the-way, that the pharmacopeia be kept up to date at all times by a perpetual commission, whose bulletins will have the effect of law. The "Working Bulletin" system of the American Pharmacological Society, once rejected by the American Medical Association, would appear to be the nucleus for the government standardization by experts who are known and who sign their reports. The decennial editions will then be mere compilations of the official decisions of the previous ten years. This plan must be adopted sooner or later and might as well be put into practice at once to eliminate "star-chamber" methods.

**The inexactness of assay methods** in the case of drugs has been mentioned by Professor A. R. L. Dohme, of Baltimore, one of the committee which made the new Pharmacopeia. (*American Druggist*, November 12, 1906.) It is shown that assayists never agree in their conclusions, even when they use the same methods, but as a rule the differences are not sufficient to disturb practitioners. It was mentioned to call attention to the fact that considerable latitude will of necessity be given by courts to assays and to interpretations of the Pharmacopeia now that it is a part of the national law. If a number of yard sticks

or pound weights are tested, it is likely that no two will be equal and not one will be exactly the same as the standard, yet no one dreams of prosecuting the dealers for such unavoidable variations. Likewise minor variations from Pharmacopeial standards need not worry the druggists; the only thing to guard against is a preparation which is practically inert and there need be none of these if the rules are followed.

**Another shameful defect in the pure food and drug law** was pointed out by Dr. H. W. Wiley, Chief of the Bureau of Chemistry, in a recent address before the Philadelphia branch of the American Pharmaceutical Association. It appears that the quack remedies are subjected to no control whatever except that the label must state the contained drugs of a certain class of poisons and refrain from misrepresentation. He says "that part of medicine and pharmacy which least needs a supervision of the law is practically the only part which comes under its supervision, while the unspeakable abuses which attend the other branch or remedies go practically unchecked." He expresses a hope that when amendments are made, they will impose a rigid inspection upon all proprietary remedies. As this is in the direction of therapeutic honesty, the law cannot be amended too soon.

**The makers of quack remedies are generally manufacturing firms in good standing**, is the startling revelation made by Dr. Wiley. He states that the maker's name is rarely on the label and that they would be heartily ashamed to have them there. "That first-class firms should lend their influence or countenance to a thing of this kind is almost incredible." Surely there is room for reform and if this is a specimen of what the new law is to bring

to light, it is amazing that we were so blind as to delay so long in enacting it. It is really discouraging that the very firms who have done so much for pharmacy and therapeutics, and whose interests the medical profession must protect, may have been guilty of secret double dealing, and have been actually increasing the very conditions which caused the present warfare. A general house-cleaning is the next step.

**The downfall of certain fancy foods** seems to be imminent if the signs of the times are prophetic. For some years patented foods fabricated of staples have been advertised as possessing virtues not found in the materials of which they are made. The public had actually come to believe that cereals made into honest bread were not as nourishing as when made into breakfast foods with ridiculous names and double prices, that apple sauce was not good unless colored and put into a fancy jar and sold under another name for ten times its value and that extract of beef is better than the proteids from which it is boiled. The awakening has come at last and the delusion has faded. Magazine readers are calling for information and the editors are dutifully giving out recipes for plain bread, meat, potatoes, and fruits. Nature's foods are coming into their own, the costs of living are lessened and the health of everyone improved. The simple life needs simple food. Bread and butter days are returning and there will be fewer calls for the doctor.

**Health conditions at Panama** continue to elicit comment both favorable and adverse, so that it is difficult for a layman to decide what the real facts are. It is unfortunate that there should be an official disposition to minimize dangers which are too well known to be denied. Indeed they

merely emphasize the good work already done, and should be acknowledged. The October, 1906, report of the Department of Health states that there had not been a death for three months among the 6,000 Americans, including women and children, and that an equal population in New York City would have furnished 30 deaths. This is hardly a fair comparison, for the sick in Panama leave for home as soon as possible and do not die on the zone. The New York City mortality is in great part due to children who are few at the Isthmus. The employes on the zone, in addition, are selected because of their good health.

**The American mortality at Panama and in the Philippines** should be far less than at home, and should be mostly confined to accidents. Many deaths from diseases merely mean that patients are not sent home soon enough to give them a chance for their lives—the great fault of policy at one time in Manila. If the disease is chronic, it is necessarily fatal, and the patient should be sent away, so as to die at home and not in a far land. As the infections may generally be avoided, the usual damage done by tropical climates is the slow deterioration of health not necessarily fatal, though it lessens the power for work. The real test of tropical sanitation, then, is not the deathrate, but the number who quit because they are unable to stand the strain.

**A case of cruel vivisection** was described at the recent meeting of the American Association for the Advancement of Science, by the experimenter, John B. Watson, of the University of Chicago. He subjected a rat to various operations, blinding it, extirpating the olfactory nerve, freezing its feet, and covering its head with collodion

—all to find out whether it had a sixth sense which would enable it to escape from a complex cage. Though a rat does not suffer as a man, yet every neurotic person is thoroughly convinced that the pain sense in every animal is as acute as in himself. Such useless cruelties, therefore, give to the morbid antivivisectionists a real basis for their crusade. The association should not have permitted this paper on its program and the cruel experiment should never have been made. We are glad to see that Watson has been censured by several conservative lay journals, which have always defended vivisection done with the direct view of obtaining or proving important facts. They very properly condemn experiments which can prove nothing. The science of medicine is now advancing by leaps and bounds through what might be called vivisection, and it is deplorable that anyone should cast discredit upon a necessity of modern existence. We hope to hear of no further useless cruelty.

**The tribute to Professor von Bergmann** upon reaching three score and ten years of age, has served to call attention to the sad fact that we have been so busy developing the material wealth of our country, that we have no sympathy with the workers who make such development possible. Von Bergmann has been the recipient of extraordinary honors at the hands of the city of Berlin, the Berlin Medical Society, the Universities, Red Cross Societies, and other associations too numerous to mention, and last but not least the general government itself. Was an American surgeon ever so honored? One was recently honored by the Pope, but none by the President.

**Physicians neglect their public duties** and therein they deprive themselves of such

honors as have been showered upon European physicians who take as keen and active a part in public affairs as lawyers do here. It has been a pride among many American physicians that they never mix in public affairs. Consequently their opinions are held in contempt, while the foreign professor is listened to with profound respect. For this reason the Hall of Fame contains the names of but few physicians, and public honors are withheld because public duties are never performed as Virchow and von Bergmann performed them. They were city fathers and national advisers. American physicians could and should be the same without abandoning their profession.

**A National Department of Health** has been suggested so many times and for such a long time, that its necessity should be pretty widely appreciated. The latest movement in that direction was made by Professor J. P. Norton, of Yale, at the meeting of the American Association for the Advancement of Science, in Ithaca last summer. He advanced the wellknown fact that democratic Anglo-Saxons, who are so jealous of their personal liberty, are utterly careless of personal safety. It seems as though we claim the right to kill ourselves off in any way we please, and while we expend vast wealth to stop hog cholera, glanders of horses, and Texas fever of cattle, we will not give a penny to eradicate tuberculosis, cancer, or pneumonia among ourselves. Professor Norton asserts that the importance of the matter deserves a yearly appropriation of a hundred million dollars.

**A campaign of health education** is needed, for when Mr. Roosevelt was consulted he had to advise that popular endorsement be first obtained. To this end

Professor Irving Fisher, of Yale, has requested the cooperation of 100 prominent citizens, who may be able to create among the people sufficient interest in keeping themselves alive, to demand a new department whose head shall be a cabinet officer. There are numerous separate bureaus dealing with biological questions which could be coordinated by this department. The pure food matters alone will require an extensive organization, not mentioning the larger ones of quarantine and the extermination of diseases which interfere with interstate communication to the injury of the rest of the nation.

**The wonderful therapeutic power of radium** was demonstrated by Dr. Robert Abbé, of New York, in the surgical section at the last meeting of the American Medical Association. He is the pioneer in this work and though it is but three years since he began, the results are so startling as to challenge credulity. Simple overgrowths of normal skin cells—warts—disappear after a few applications of the tube. Lupus, epitheliomas, and sarcomas undergo retrograde metamorphosis, the atypic cells being replaced by normal ones; even bone being regenerated where it had been destroyed. Some cases were of long standing, had been pronounced inoperable and had resisted röntgen-ray applications. Internal cancers were beyond reach of the rays and showed no benefit, but all superficial growths were promptly cured by a few applications of an hour each even in the nasal or other cavities which cannot be reached by the other rays. Nothing is said of uterine cancers, though radium is presumably curative here also.

**The effect of radium upon cell life** is wholly unknown. Prolonged applications undoubtedly kill every living tissue within

reach, producing intractable ulcers. With less severe doses there is a gradual loss of vitality, and mice so treated die within a few weeks, so that it is a dangerous remedy, to be used with caution. Abbé thinks that applications which were too prolonged, aggravated some cases, but when properly applied its "alterative" effect was wonderful. The abnormal cells simply disappeared—perhaps they were unstable and were killed by a dose harmless to the normal cells. Indeed it seemed as though the therapeutic dosage stimulated normal cells to an embryonic activity so that they regenerated lost tissue even to restoring the natural shape of a sarcomatous jaw bone. When it is considered that an indefinite number of cases can be cured by one tiny tube in which there is but a grain of radium and that the power lasts apparently for centuries or millenniums with no measurable loss of weight or energy, the imagination is simply stunned at this modern therapeutic use of a very recent scientific discovery.

**The death of Professor Curie** in Paris a few months ago was another of those deplorable city disasters due to the modern mania for rapid transit. He was run down by a vehicle and the world lost one of its greatest benefactors. Indeed his discovery of radium by the aid of Madam Curie, is another of the interminable list of discoveries in pure science, made by workers who had not the slightest idea of their practical value. He not only revolutionized the conceptions of chemists and physicists, but within five years, there are innumerable people saved from inevitable death by the therapeutic use of the new element whose very existence was unsuspected a decade ago. Surely, we as a people, should have sense enough to encourage scientific investigation, instead of leaving it to devoted enthusiasts, like the

Curies, who actually deprived themselves of the necessities of life to buy materials for their laboratory. Yet the very ones now being benefited by radium may be the first to object to the work of other scientists as "impractical."

**Sleeping-sickness treated successfully with thymol** is the report from Saigon, China, where two French physicians are said to have used it very extensively. If this is true, it removes one more of the barriers to the conquest of the tropics. This disease is undoubtedly due to trypanosomes. Its spread throughout wide areas in Africa has caused consternation, for it seemed destined to wipe out the native population wherever the special intermediary host abounds. Intercommunication is so extensive that the parasite has been carried into new places where it had not been before, and in due time it will no doubt be found wherever the fly is. Cases were invariably fatal, as we were helpless. No drug seemed to have the slightest effect upon the invading parasites. A few white men have been infected and some have returned to Europe to die. In addition to the enormous saving of life, comparable to that due to the discovery of yellow fever transmission, there is the further possibility that by a similar use of thymol in infected animals, it will be possible to import European stock. At present the mortality from the parasite is so great that all efforts to stock the tropics with better animals have been hampered if not failures. The money saving will be enormous. We hope the news is true.

**The unnaturalness of decimal divisions** was mentioned in these columns as the main argument of Herbert Spencer in his opposition to any change in the English measures which grew up by reason of their

ease of dividing them into halves, quarters and eighths—the normal method. It now appears that Spencer was not the originator of the argument nor was he the first to mention the facts. Dr. Edward T. Williams, of Boston, Mass., mentioned these things twenty-one years before Spencer. So early as October 28, 1875, and at subsequent times in *The Boston Med. and Surg. Journal* Williams showed that the decimal system was not suited for practical purposes outside the laboratory. His wisdom and forethought have been amply proved.

**Loosening of the upper jaw** is a bit of lay information for which we are indebted to the *New York Tribune* (Oct. 29, 1906). An article described a case of tetanus in a little boy who infected his vaccination while playing in some filth, and who was successfully treated in one of the hospitals. Of course the fixation of the jaws and their relaxation were the main symptoms which appealed to the reporter. "Two weeks ago" he says, "the lower jaw fell and the upper jaw began to loosen." As soon as the little fellow could use his jaws, he exclaimed, "now I can go to school!" We are much afraid that if the boy did actually say this, there was something else loose beside his jaws. Perhaps it was the thought of a return to school which made his jaw fall. If the upper one followed suit, we might put it down as one more of the dreadful results of these new-fangled antitoxins against which our conservatives hurl their thunder. What a horrible prospect to go through life with a loose upper jaw! Language is loose enough at the best, but what will his be? Perhaps he will become a reporter for *The Tribune* and haunt the hospitals for loose stories for lay readers to marvel or to shudder at.

## BOOK REVIEWS.

**Consumption: Its Relation to Man and His Civilization, Its Prevention and Cure.**—By JOHN BESSNER HUBER, A. M., M. D. Philadelphia and London: J. B. Lippincott Company, 1906.

Dr. Huber has made a comprehensive study of consumption from the medical and sociological standpoints. This book, which shows the result of years of work, is an exposition of the effect of consumption upon the human race, and should be within reach of every intelligent consumptive. As a comprehensive textbook it should be studied by medical men. To the employers of labor, to the health officer, and to the sociologist this book commends itself. Every page is interesting. The subject-matter is well selected and presented. The style is fascinating and altogether modern. The printing is faultless, and the illustrations are new and original. On account of the recent interest displayed by the public in the effort to stamp out the "white plague" we predict a great popularity for this excellent book.

**The Eye and Nervous System, Their Diagnostic Relations.**—Edited by W. C. POSEY, A. B., M. D., and W. G. SPILLER, M. D. Illustrated. Cloth. Pp. 988. Price, \$6.00. Philadelphia: J. B. Lippincott Company,

The announced object of this work is to present under a single cover the phases of ophthalmology and neurology which are in any way connected with each other, thus facilitating the labors of the specialists and presenting ophthalmoneurology in a convenient form for the practical aid of the general practitioner. A comprehensive view of the arrangement of this work indicates that the authors have fallen wide of their mark. A large portion of the text is elemental or trite from the standpoint of the practising oculist and useless to the neurologist. Especially superfluous are the articles on anatomy and optics, the use of the ophthalmoscope, and intracranial surgery. Throughout the work there is endless padding by explanations and descriptions of terms and symptoms with which every oculist or neurologist should be thoroughly familiar. Again, the arrangement is most confusing, as, for instance, the ocular signs of tabes are placed under the unfamiliar heading "Parasyphilitic Affections" instead of under "Diseases of the Spinal Cord." The most praiseworthy chapters are those by Drs. Spiller, Mills, Duane, deSchweinitz, Dercum and Risley. It is refreshing to read the frank acknowledgments of Risley and Hansell—of the profound influence of eyestrain in the etiology of many general affections. Unfortunately, in close proximity to these valuable and enlightening articles, the editors have allowed the insertion of the foolish and futile attempt of J. H. Lloyd to pose as the champion of the one-time fashionable contention that refracting oculists were narrow-minded hobby-riders. In his desire to be particularly contemptuous, the author has even sac-

rificed his former pleasing literary style. The typography of the book is excellent, and, had the text been properly edited and systematically arranged, it would have made a valuable work to those unfamiliar with the European languages. But with these requirements met, its size would have been reduced at least one-half.

**Obstetrics for Nurses.**—By JOSEPH B. DELEE. Second Edition, thoroughly revised and enlarged. Philadelphia and London: W. B. Saunders Company, 1906.

In this edition 40 new illustrations and 47 pages of reading matter have been added. The subject has been brought down to date in all that pertains to obstetric nursing. We know of no better guide for nurses on this branch and young graduates in medicine will find it well worthy of perusal, as they will find many helpful statements as to technic.

**A History of Chemistry.**—By ERNST VON MEYER. Translated with the author's sanction by GEORGE MCGOWAN. Third English edition. New York: The Macmillan Company, 1906.

This edition is translated from the third German edition of von Meyer's authoritative work but the editor has introduced various additions and alterations. They have, however, been sanctioned by the author and he has read the proof sheets. The book now has 655 pages of text and serves also as an introduction to the study of chemistry.

**Text-book on Diseases of the Heart.**—By GRHAM STEELL, Manchester. With an appendix on The Volume of Blood in Relation to Heart Disease by J. LORRAIN SMITH. Philadelphia: P. Blakiston's Son & Co., 1906.

The author states he has endeavored to give an accurate account of the clinical aspect of heart disease along with the principles of treatment. In the latter he does not go beyond the facts of actual bedside experience and hence his advice has first-hand value. It is not necessary to outline the subjects treated in the 371 pages of the book, as they are well known. They are all handled in a masterly manner and the volume will be a distinct help to every clinician. We heartily commend it to the profession.

**Radiotherapy in Skin Diseases.**—By Dr. J. BELOT. With a Preface by DR. L. BROCO. Translated by W. DEANE BUTCHER, M. R. C. S. Only Authorized Translation from the Second French Edition. Rebman Company, New York and London, 1906.

In the early days of the employment of the röntgen ray as a therapeutic agent it was difficult, if not impossible, to give precise directions as to the amount of irradiation necessary to produce a given result, owing chiefly to the lack of instruments of precision with which to measure the quantity and quality of the rays. Today, however, through the ingenuity of a number of investigators, we are in possession of meters by the use of which we are en-

abled to regulate the dose of the röntgen ray almost as exactly as that of drugs. In this excellent manual of Belot the old rule-of-thumb methods are relegated to the background, and the most precise directions are given for the employment of the rays in the treatment of diseases of the skin, great emphasis being laid upon accuracy of dosage determined chiefly by the instruments of Holzkecht and Benoist. In the author's opinion, the source of the rays is a matter of no importance whatever, so long as their quantity and quality are accurately measured. He prefers to give the entire dose at one sitting when this can be done without danger to the integrity of the skin, a safe dose being from seven to eight of Holzkecht's units. When it is necessary to give several exposures an interval of from 10 to 20 days should elapse between them, allowing all reaction to disappear before treatment is resumed. Attention is called to the fact, which we have frequently observed, that a skin which has once been subjected to the rays is more sensitive than one which has not, and, therefore, the length of the exposures should be diminished as soon as the lesions begin to be modified. Radiodermatitis is not at all necessary to produce a cure, and its production should be avoided when possible.

We regard this manual as a very useful one indeed, and heartily recommend it to those who desire an intelligent and safe guide to the use of this very potent and valuable therapeutic agent.

**Reference Handbook of the Diseases of Children.**—By PROF. DR. FERDINAND FRUHWALD, of Vienna. Edited, with additions, by THOMPSON S. WESTCOTT, M.D. W. B. Saunders Company, Philadelphia and London, 1906.

This work, as the title denotes, is to be used as a volume of ready reference in the practice of pediatrics. It is not designed to take the place of a textbook, as most of the articles are considered too briefly to admit of such use. The subjects are arranged in alphabetical order, and numerous cross references render a special index unnecessary. Valuable articles of considerable length are contributed on gastrointestinal diseases, infant feeding, heart disease, rachitis, hereditary syphilis, and other important subjects. Confusion of nomenclature may be produced in the American mind by the use of rubeola and rubella as synonymous terms, and the application of the term "herpes tonsillans" to ringworm of the scalp. The translation has been very well and clearly done, while numerous editorial notes add greatly to the value of the work.

**Problems of Babyhood.**—By RACHEL KENT FITZ, A.M., and GEORGE WELLS FITZ, M.D. Illustrated. New York: Henry Holt & Company, 1906.

This little book of 127 pages, dedicated "To those parents who deem the training of their children their supreme privilege and duty," is very timely in this age of parental laxness in hygienic and disciplinary matters pertaining to their offspring. The first part, *Building a Constitution*, contains four chapters on Fresh Air, Clothing, Sleep and Exer-

cise. Part two, *Forming a Character*, is made up of three chapters on Foundations, The Mother, and The Child. On some points we would differ slightly, and on one, the amount of clothing for the baby, quite decidedly from the writers, but the book is very instructive and will prove of great value for every parent who reads it.

**Problems in Animal Metabolism.**—By J. B. LEATHES. Philadelphia: P. Blakiston's Son & Co., 1906.

A course of eight lectures delivered in the London University forms the contents of this book of 205 pages. A consideration of the assimilation and synthesis and also the catabolism of carbohydrates, fat, and proteids makes up the bulk of the text. Numerous references to literature are given and as a whole the book is a very concise presentation of known facts, and also of theories regarding this difficult subject. The author specially emphasizes the value of theories as paving the way for actual knowledge along this line of research.

**A Compend of Diseases of the Skin.**—By JAY F. SCHAMBERG, A.B., M.D. Fourth edition, revised and enlarged. With 108 illustrations. P. Blakiston's Son & Co., Philadelphia, 1905.

The present (fourth) edition of Schamberg's *Compend of Diseases of the Skin* differs from former ones chiefly by the addition of a section on the use of the Finsen light and the röntgen ray in the treatment of cutaneous diseases. This, and other less important additions and alterations, have brought the manual up to date; and it continues to be a useful book for those who desire an outline of the diagnosis and treatment of diseases of the skin within the smallest possible compass.

**Refraction, Including Muscle Imbalance and the Adjustment of Glasses.**—By ROGAL S. COPELAND, A.M., M.D., and ADOLPH E. IBERSHOFF, M.D., of the University of Michigan. Philadelphia: Boericke & Tafel, 1906.

The authors of this handbook have endeavored to simplify the teaching of the principles and practice of refraction and allied subjects, divesting them so far as possible of theoretic demonstrations and logarithmic computations. Particularly praiseworthy are the diagrams and illustrations, many of which are original. Their practical value adds much to the usefulness of the work to beginners in ophthalmology.

**Medical and Pharmaceutical Latin.**—By REGINALD R. BENNETT, London. J. & A. Churchill, London. P. Blakiston's Son & Co., Philadelphia, 1906.

In this book written for students of pharmacy and medicine, the author has supplied a guide to the grammatical construction and translation of physician's prescriptions in Latin. Conjugations of the verb are given, followed by many pages of model prescriptions in Latin and English. A copious Latin-English and English-Latin vocabulary closes the book. It is a good student's guide book.

## ORIGINAL ARTICLES.

### FRACTURES OF THE SPINE, WITH REPORT OF TWO CASES TERMINATING IN RECOVERY.\*

BY

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"The death most to fear is the death we least dream of."—HORACE.

Fractures of the spine are properly divided into two classes: (1) Fractures with injury to the cord; (2) fractures without injury to the cord. About 20 percent of these injuries to the spine are fractures alone, and about 20 percent are dislocations alone, and about 60 percent consist of fractures and dislocations together and are known as fracture dislocations. Thus we have the pure fracture which may be simple or compound, the pure dislocation and the combination of the two. The vertebrae most commonly fractured are the fourth, fifth, and sixth cervical, the twelfth dorsal and the first lumbar. Out of 146 recorded cases, there were 94 cervical, 42 dorsal, 8 lumbar, 2 location not stated. The injury to the vertebrae is caused in one of three ways: By a direct blow fracturing the arches, by a fall upon the head and neck crushing the bodies of the vertebrae, or by forced flexion, the head and neck being bent forward upon the chest, or the thorax upon the pelvis, as caving of embankments or falls in which the person strikes upon the feet or buttocks. "More than one-half of the fractures of cervical vertebrae are fractures of the spinous process."<sup>1</sup> Fracture of the arches is more common than ordinarily supposed. In 81 cases of resection of the spine for fracture and luxation White<sup>2</sup> found a record of fracture of the arches or laminae in 45 percent. "Dislocation without fracture may occur in the cervical region, it is rare in any other region of the spine."—*Vide supra*. Pure fractures of the vertebrae are of rather infrequent occurrence in the cervical region.<sup>3</sup> Of 36 cases observed at Guy's Hospital and mentioned by Mr. Bryant in which the cervical

vertebrae were injured, there was no example of pure fracture, while there were 11 examples of pure dislocation and 25 examples of fracture combined with dislocation. Still pure fractures of the cervical vertebrae are occasionally met. In the dorsal and lumbar regions most cases of pure fracture of the spine occur. In these regions pure dislocation is rare, fracture with dislocation being more frequently met than pure fracture.<sup>4</sup> It will be remembered that when a force acts upon a column of varying elasticity, it will break most easily where the flexible and less flexible parts join; these conditions are at the lower cervical region and at the twelfth dorsal and first lumbar. Men, from the greater exposure incident to their lives, are more subject to injuries of the spine than are women. Of 18 cases in which the dorsal, and two cases in which the lumbar vertebrae were injured and which were observed at Guy's Hospital, nearly two-thirds appear to have been examples of fracture and dislocation combined. In the 25 cases of combined fracture and dislocation of the cervical vertebrae that were noted at Guy's Hospital, the lesion was below the third cervical vertebra in all but three cases; in one of these the second, third, and fourth were involved, in another the arch of the atlas and the spinous processes of the second and third vertebrae, and in the third case the bodies and laminae of the third, fourth, and fifth cervical vertebrae. In 18 dorsal cases of all sorts, seven were in the upper and 11 in the lower half of the dorsal region.<sup>5</sup> Keen states that the bodies of the vertebrae are much more frequently fractured than the arches.

The following cases are reported with the hope that some good may be accomplished, and that others meeting such cases will do what can be done toward saving the life of the patient. I will acknowledge that I have been slow to report the cases for I hardly thought much good could be accomplished by so doing. The profession as well as the laity are skeptical about people with broken necks recovering, believing that there has been either a mistake in diagnosis, or considering the reporting surgeon somewhat

\*Read before the Clinical Society, Portland, Maine, March 16, 1906.

bombastic for reporting what is purely accidental and not likely to reoccur, but, as Oliver Wendell Holmes says, "I am too much in earnest either for humility or vanity, but I do intreat those who, sometimes, hold the keys of life and death, to listen to me also for this 'once.'" The barbaric and cruel manner prevalent in this country of putting criminals to death by "breaking their necks" is largely responsible for the belief that the thing is uncanny and always fatal, but even the dislocation of the axis from the atlas or the fracture of the odontoid process of the axis is not invariably fatal. I have had occasion to study the subject, and while I find that cases of fracture of the cervical vertebrae followed by recovery are very rare they are by no means unique.

**CASE I.**—Fracture of the sixth cervical vertebra with marked deformity and crepitus but no paralysis. Recovery.

The patient is J. F., white, male, aged 66; a man of intelligence and the captain of a vessel. Family history is negative. The patient states that he was ascending a ladder, using only one hand, having a bundle in the other; the foot of the ladder rested against the wharf, the upper end against the rail of the vessel. He had just reached the rail of the vessel when the ladder slipped and he fell a distance of about 23 feet, striking on his neck and shoulders. He was rendered unconscious and remained so for about 20 minutes; he was taken aboard the ship, where he remained throughout the night in great pain, and unable to move his head at all; he stated that there was a swelling as large as an orange at the site of the injury, over the sixth cervical vertebra, the pain was so great that he tried to move his arms and shoulders in order to relieve it and in doing so he felt, and heard a decided snap, as if he had restored a bone that had been out of place. After this he felt somewhat easier, the pain not being so great. The next morning he was carried to a hospital in Baltimore where he remained under treatment for 22 days. As he did not think he was improving he left the hospital of his own accord. No attempt was made to reduce the fracture at this time, so it is presumed the proper diagnosis was not made, though he was unable to raise his chin from his chest or move his head at all. After leaving the hospital, he had no medical attention for three months. He was admitted to the Marine Hospital March 29,

1904, nearly four months after receiving the injury. From notes taken at the time of admission, I find that the patient was suffering considerable pain, the head and neck were bent forward at an angle of about 80° to the spinal column, the chin resting on the sternum. As is well known the sternum is sometimes fractured in these cases from impact of the chin; nothing of this kind had happened in this case. The patient could not raise his head or bend his neck; in order to look around he had to move his whole body. Physical examination showed a depression over the sixth cervical vertebra, distinct crepitus could be elicited by manipulating the bone with the fingers, and pressing on top of the head. Any attempt to move the head or raise the chin caused excruciating pain; the man's movements were uncertain and paretic, he walked as if not certain of himself; this was probably caused by the position of the head. Pupils were slightly dilated. Pulse 84; temperature 37°. Having explained to the patient the dangers of surgical interference and he having elected to accept these, saying that death was preferable to such suffering, he was placed in a horizontal position on a table, and ether was administered. Firm pressure was made upon each side of the sixth cervical vertebra by an assistant, and at the same time strong traction was made upon the head. Pulling in line of its new axis, the head was gradually raised to its normal position. The patient was kept perfectly still until the effects of the anesthetic had passed off, then he was carefully raised, and a Sayre's extension apparatus adjusted under the occiput and chin, and traction by means of ropes and pulleys made until the spine was perfectly straight and the sulcus over the sixth cervical had disappeared, then a plaster jacket was placed from the ilium to the occiput, the chin was tilted slightly up and held in this position by the axillary end of a crutch, which was padded and fitted snugly under chin. The crutch had been sawn off just above the rung which is grasped by the hand; this left two ends, about a foot long, which were spread apart, one end on each side of chest and fixed in the plaster jacket, thus elevating the head and making forced extension of the head upon the spine. The patient suffered considerable pain and great fortitude was necessary on his part in order to sustain this position. Morphine was used daily for the first week. The plaster-jacket was removed at the end of three weeks, there was no longer pain or deformity, union having taken place. A week later the patient was discharged cured.

I saw this man a year later aboard one of the harbor boats, in Portland. He was in excellent health, the only perceptible deformity at this time was a slight bending forward of the head and neck, there was ankylosis between the sixth and seventh cervical vertebrae, which gave him a feeling of stiffness in the neck. Movement of the head was slow, but he suffered no pain—he was in good condition mentally and physically and able to earn a living. As stated before, fractures of the sternum are not infrequently associated with injuries of the spine. Mr. Bryant says it was found four times in 56 fatal cases of spinal fracture and dislocation which were observed at Guy's Hospital. Fracture without deformity or other special symptoms sometimes occurs; the danger then is from inflammation of the connective tissue, lying between the theca vertebralis and the bone, this may result in abscess and thus destroy life. Ashhurst<sup>6</sup> mentions the case of a girl who fell down an embankment. She was stunned, but was able to go to work soon. Fifteen days later, she entered St. Thomas' Hospital complaining of pain between the shoulders, this was followed next day by numbness and twitching of the limbs, delirium, etc. Death occurred on the eighteenth day. Autopsy showed fracture of the seventh cervical vertebra and the spinal canal filled with pus. Examples of this kind are not uncommon; it is therefore important to bear these facts in mind when called to treat sprains, twists, and wrenches of the spine. In concealed fracture, however, the pain and tenderness on pressure are usually confined to one or two vertebrae; a painful point that can be covered by the end of the finger indicates fracture here as elsewhere. Disability is greater in fracture than in sprain. If a patient with sprain is assisted to the sitting position he can retain it, not so in fracture; the patient cannot sit up unless supported. Sudden pressure on the head may be of value<sup>7</sup> when the injury has occurred some little time before.

CASE II.—Fracture of the fifth and sixth cervical vertebrae with dislocation forward and to the right side. Very marked deformity,

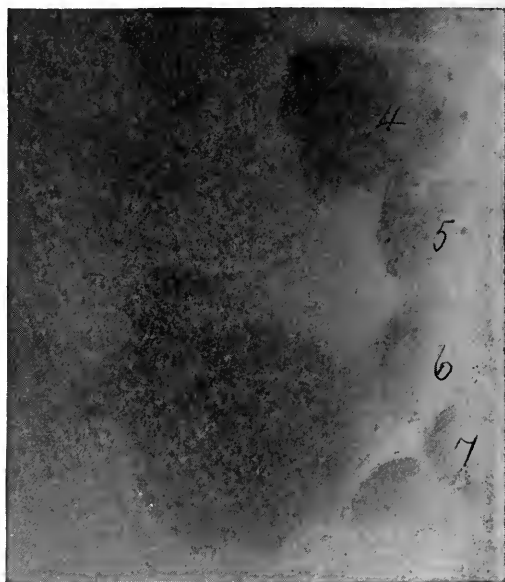
bulging forward of front of neck, flaccidity and bulging of sternocleidomastoids. Paralysis of both sensation and motion. Abolition of tendon reflexes. No interference with thermogenic centers, no priapism. Treatment: Reduction and plaster jacket. Recovery.

E. S., a white male, aged 27, a sailor, was sent down from Rockland with a diagnosis of broken neck.

*History.*—In attempting to jump from a carriage, which was in motion, he struck the pavement with his head and shoulders. Another man who jumped about the same time, fell on top of him, crushing or bending his head and neck under his body. (The position one would be in, trying to turn a somersault, and while the head was on the ground and the feet in the air, a heavy body should fall upon him bending the body forward while the head and neck remained fixed.) When taken up the man was unconscious and remained so for some time. He was placed on a mattress, carried to the train and shipped in a box car to this city, still lying upon the mattress. In the same way he was put into the ambulance but by this time he had recovered consciousness and was suffering excruciating pain in his neck and shoulders, or rather the left shoulder. It was necessary to use morphia twice from the time of his arrival until he reached the hospital. Examination showed the pupils contracted but equal, the sight hazy. Articulation was very difficult, he could not speak above a whisper. The anterior aspect of the neck was bulged forward, the pomum adami was almost on a level with the chin. The sternocleidomastoids were very prominent at the angle of the jaws, but flaccid. There was almost complete paralysis of sensation and motion below the root of the neck. There was slight sensation on the inner side of the arms and thighs, the left arm being somewhat less anesthetic than the right. There was no skin reflex below the lesion except the cremasteric. Scratching the inner side of the thigh caused retraction of the testicle, tendon reflex was abolished in the arms, patella reflex was absent. There was some motion in the left arm, though he could not raise the arm at all. The shoulder and arm were drawn up in the position which Thorburn<sup>8</sup> says is almost pathognomonic of the "fifth root group." The fifth cervical nerve supplies chiefly the biceps, the brachialis anticus, the deltoid, and the supinators. If this nerve is not injured these muscles will still act, indicating that the lesion is lower down; in this case, however, the fifth cervical nerve had only

escaped on one side, the muscles of the right arm being completely paralyzed. The patient could move the head slightly, showing that the articulation of the atlas upon the axis was not involved. The respirations were rapid and entirely by the diaphragm. The posterior aspect of the neck showed decided deformity, there was a wide gap, or interval, which marked the separation of the spinous processes of the injured vertebrae. The fifth and sixth cervical vertebrae were fractured and dislocated forward and to the right, a line carried up the spine from the dorsolumbar region was perfectly straight until it reached the seventh cervical vertebra, then there was a depression and an interval of more than an inch forward and to the right. In other words, the head and the six upper cervical vertebrae were fully an inch nearer to the right than to the left shoulder. This is what is called a pathologic curiosity, for displacement of the vertebrae is almost invariably directly to the front, but this right lateral displacement was so plain, that all the assistants and nurses noticed it before any measurements were made. This deformity with the abrupt bend in the axis of the spinal column at the point of separation between the vertebrae indicated, as just stated, that the first bone above that point, together with the cervical vertebrae resting upon it was displaced to the right and forward, while the rest of the spinal column remained fixed or unmoved. Slight crepitus could be elicited, but it was not deemed proper to make any manipulations to develop this symptom. The patient could feel a grating as well as hear it; this indicated a fracture dislocation at the point mentioned. Fracture and dislocation of the cervical vertebrae going together in a large majority of cases. The pressure symptoms were caused, of course, by the displacement. The respiratory movements indicated that the lesion of the cord was below the origin of the phrenic nerve, and the paralysis of the upper extremities that it was above the origin of the brachial plexus. As the patient was unable to urinate, catheterization was done. When the patient was gently placed upon his side, he could move the head a little, but could not move it at all when lying on his back. A skiagraph of the neck was made which I think shows the fracture and dislocation very plainly. The exposure was for thirty minutes with a double dipped röntgen-ray plate, with a Crooks' tube and a Holtz induction machine. The displacement could be easily seen with the fluoroscope. The skiagraph as exhibited shows what appears to be a fracture of the fifth, sixth, and seventh

cervical vertebrae, the displacement is not so well seen. The cervical vertebrae above the point of fracture are sprung forward. The patient was suffering from shock, so no attempt was made at reduction. Nothing was done for the next few days except to make the patient comfortable; he was kept on an air mattress, the head held in place by pillows arranged on each side, the urine drawn about every eight hours and salol administered in 0.65 gm. (10 gr.) doses three times a day. All precautions were taken to prevent bed-sores, great care was taken to keep the patient clean and stimulating lotions were applied to parts when the skin looked red or where there was pressure. As there was some tympanitis



a large enema containing 0.65 gm. (10 gr.) of quinin after the manner of Skene<sup>9</sup> was administered, which brought some fecal matter and large quantities of flatus. By the end of the second day there was considerable improvement, the breathing was still diaphragmatic. The plantar reflex was present, he could move his legs a little, also move his left arm, the balance of the muscles below the injury were still paralyzed. He could not move his head as he was lying on his back. Twenty-four hours later, that is four days after receiving the injury, the patient was suffering from a severe coryza as if he had contracted a cold. There was no further improvement, in fact, the patient did not appear to be doing so well, as what movements he could make were very sluggish.

The patient was taken up by two attendants,

the head being carefully held by one of the assistant surgeons, and was placed upon a stool. The chin and occipital straps of Sayre's apparatus were quickly fitted in place, traction by rope and pulley was begun, the man still being supported by attendants. Grasping the neck with both hands, with fingers spread out covering the sides and front of the neck and the thumbs meeting at the point of displacement, gentle and steady pressure was made while the traction force was increased; it was necessary for two men to draw on the ropes, even with compound pulleys, and to raise the man slightly from the stool before reposition was effected, there was no "snap" or click; just a little grating and the spine from being an inch out of line was straight. The patient was unconscious so the traction was lessened, a plaster-of-Paris jacket was applied from the occiput and chin to the hips. The plaster hardened rapidly, and the man was not kept suspended more than 15 minutes. I had told the patient before beginning the traction that there was danger of killing him, and when he was lowered and placed on a mattress, I was almost positive that such had been the case; he was profoundly unconscious, the pulse just fluttering, breathing not perceptible. He remained in this condition probably 20 minutes, then the color gradually returned to his face and he regained consciousness. From this time improvement was comparatively rapid, the next day he could pass his urine without a catheter; this was not the case all the time, however, as the catheter had to be used occasionally for a couple of weeks. Sensation and motion gradually returned. One month after receiving the injury he moved his right arm for the first time; sensation had not returned, however, there being only a slight tingling as he expressed it in his fingers; he could feed himself with his left hand and was able to stand on his feet, reflexes were noted as being dull. The plaster cast fitted so tightly that he could not move his head. A few days later the cast was removed; there was rather an ugly sore under the chin where the plaster had pressed, but otherwise there was no trouble with the skin. His neck was stiff and he could not raise his right arm but could move it a little. Sensation had not returned; he could move his head back and forth, if he attempted to raise his arm the head was drawn to that side. Two months from the time of receiving the injury, the man was practically well. He could walk well, use his left arm freely, the extensors and supinators of the right arm were still paralyzed. Sen-

sation was good except in the fingers of the right hand, the neck was stiff as it naturally would be from ankylosis. The man was discharged two months and two days after receipt of the injury.

I heard afterward that he was exhibited in a dime museum in Boston as the only man living with a broken neck. Nearly a year later I received a letter from this man saying that he was well except for a "couple of pains in the left side of his neck," and asking for a certificate to show that his neck had been broken as no one would believe him when he said so.

In both my cases the gap which marked the separation of spinous processes of the vertebrae particularly injured the displacement and the abrupt bend in the axis of the spinal column at the point of separation of the two vertebrae with stiffness of the neck, denoted that the first bone above that point, together with all the cervical vertebrae resting upon it were dislocated, while the rest of the spinal column remained fixed, and as crepitus could be detected, fracture was also shown to be present. Of 36 cases mentioned by Mr. Bryant in which the cervical vertebrae were injured, 25 were fracture and dislocation combined. The compression of the spinal cord in the second case reported was caused by the displacement forward and latterly of the dislocated vertebrae and the indication for treatment was to remove the pressure by replacing the bone. In all of the 36 analogous cases at Guy's Hospital the patients died inside of 72 hours. Three cases of recovery by means of reduction from symmetric dislocations occurring among the five lower cervical vertebrae, are given in Ashhurst's<sup>10</sup> tables. In nearly all cases of fracture combined with dislocation occurring in the cervical region, the laminae, or the transverse or the spinous processes are fractured, the subflava and capsular ligaments and the intervertebral disk are lacerated. Fractures of the cervical vertebrae are generally fatal; there are, however, a sufficient number of recoveries recorded to make it worth while to try to save life. Hamilton<sup>11</sup> collected ten cases of fracture of the five lower cervical vertebrae, in which one patient lived 14 years. Ollivier d' Angers<sup>12</sup> reported the case of a

man who fell backward from a wheel injuring his neck; there was mobility of the seventh cervical vertebra with paralysis. The paralysis disappeared under treatment and at the end of three years he was nearly well. The same author reports the case of a man falling and striking the back of his head. There was paralysis, etc., in two and a half months he recovered. Six months later he fell and broke his neck again. Dissection showed that the original injury consisted of fractures of the fourth and fifth cervical vertebrae, the body of the fourth having been broken, the callus had been fractured by the second fall; but for the second accident the man would have fully recovered from the original injury. Mr. Hutchinson<sup>13</sup> reports two cases, one of a woman and the other of a man in which there was fracture of the lower cervical vertebrae with partial paralysis, yet both recovered. Hilton has reported a case in which there were fractures of the fifth, sixth, and seventh cervical vertebrae with complete paralysis from the neck down, the patient lived 14 years in a paralyzed condition. Dissection showed the bodies of the fifth, sixth, and seventh cervical vertebrae blended together by bone, the intervertebral substances having disappeared.

CASE I.—Gerster,<sup>14</sup> at a meeting of New York Surgical Society, April 27, 1887, reported a case of fracture of the fifth cervical vertebra with recovery. The patient, a boy aged 13, while bathing at the seashore struck his head violently against the bottom, he was stunned and was taken from the water by playmates. There was paralysis of the left upper and lower extremities and the bladder and rectum, there was also paralysis of the right upper extremity (except the shoulder muscles) and paresis of the right leg. Spinous process of the fifth cervical vertebra was depressed and gave marked crepitus on stretching the patient's neck and then letting it go, the head could not be held up without support. No priapism. Treatment by weight extension with recovery.

CASE II.—Dr. Alexander W. Acheson<sup>15</sup> reports a case of luxation of the cervical spine with reduction and recovery.

A man aged 55, a railroad conductor, fell, striking his head between two ties, the brake beam caught his body, pushing it toward his

head and making him turn a complete somersault. His upper extremities were paralyzed with deformity at the cervical spine. He was treated by extension and plaster cast, and recovered.

CASE III.—Landon Carter Gray<sup>16</sup> reports the case of a boy, aged 15 years, who suffered a dislocation of the cervical vertebra in consequence of a fall on the head in a vain attempt to turn a somersault. For 13 weeks there were no symptoms, except difficulty in deglutition, then came a vesical paresis, followed by numbness in both upper and lower extremities, quickly followed by a motor paralysis of both upper and lower extremities. Later there was tactile anesthesia of the left upper and lower extremities. The spinous process of the third cervical vertebra was deviated sharply to the right. There was swelling on the back, with pain on pressure, by inserting the finger into the mouth a distinct depression could be felt in the posterior pharyngeal wall corresponding to the third cervical vertebra. Reduction by extension and counter-extension was done with disappearance of symptoms. A relaxation occurred which caused similar symptoms. A second reduction produced a permanent cure.

CASES IV, V, VI.—Dr. R. B. Bontecou<sup>17</sup> reported to the New York State Medical Association, November, 1886, three cases of fracture or dislocation of the cervical vertebrae. Two patients died soon after receiving the injury. The other patient was paralyzed, but was treated by continuous extension for several weeks, and recovered and lived for 20 years. At autopsy the fifth, sixth, and seventh cervical vertebrae were found fused together.

CASE VII.—Dr. Edward S. Dwight<sup>18</sup> reported a case of dislocation and fracture of the seventh cervical vertebra in a woman of 55. There was paralysis, loss of reflexes, etc., the patient made a partial recovery and lived one year. No method of treatment is stated.

CASES VIII AND IX.—At the fourteenth annual meeting of American Neurological Association, 1888, Washington, Dr. G. L. Walton<sup>19</sup> reported two cases of dislocation of cervical vertebra in which spontaneous recovery had taken place. The author exhibited a photograph of a skull and spine showing fracture and dislocation of cervical vertebra without interference with the spinal canal.

CASES X, XI, XII.—Three cases of fracture of the sixth cervical vertebra reported by Dr. W. S. England.<sup>20</sup> The first patient fell a distance of 35 feet, there was complete sensory and motor paralysis below the arms and paresis

of upper extremities. The patella, cremasteric, abdominal, and ankle clonus were absent, there was no deformity of the back. Treatment was by palliation. Patient died in two days. Autopsy showed fracture of the sixth cervical vertebra. The second patient fell on the back of the head and neck. Symptoms were practically the same as in the former case. There was some priapism. Dr. Bell did a laminectomy, both the fifth and sixth cervical vertebrae were found to be fractured through the left laminae. Patient died in four days. The third patient was injured by being caught in the belt of a rapidly revolving wheel. There was sensory and motor paralysis of the whole body below the third intercostal space. Marked prominence of the sixth cervical vertebra was found. Laminectomy was done, about an inch of the cord substance was found badly crushed, patient lived three days.

CASE XIII.—Dr. N. E. Brill<sup>21</sup> reported to the American Neurological Association, at its sixteenth annual meeting, a case of fracture of the laminae of the fifth cervical vertebra followed by pseudohypotrophic paralysis.

CASE XIV.—At a meeting of the New York Surgical Society, March, 1891, Dr. A. J. McCosh<sup>22</sup> reported the case of a man injured 18 months before; there was supposed to be fracture of the fourth, fifth and sixth cervical vertebrae. There had been complete paralysis of the entire body below the clavicle. Later he had some use of the right arm, the left arm was utterly useless. He was never free from pain, could not stand. Laminectomy was done and almost complete recovery followed.

CASE XV.—Dr. McCosh<sup>23</sup> also reports a case of old fracture of the fourth cervical vertebra with extensive paralysis. Laminectomy eight months later with cure. He reports in all six laminectomies in fractures of the spine with two recoveries and four deaths.

CASE XVI.—Dr. John B. Murphy<sup>24</sup> reports the case of a man who fell from a trapeze suffering from fracture of the spine. There was irregular paralysis from the sixth cervical vertebra down. One arm was completely paralyzed, the other arm partially so, no operation, complete recovery in three months.

CASE XVII.—Dr. Mixer<sup>25</sup> reports the case of a healthy man who fell from a tree some six or eight feet to the ground, striking on his head. He suffered fractures of the fifth and sixth cervical vertebrae. There was complete loss of sensation and motion, corresponding to a lesion of the cord in the injured region, the temperature had already begun to rise the next morning.

Laminectomy was done. In addition to several fractures the laminae were dislocated. No gross sign of injury to the cord was found, the dura was not closed and the wound was drained. At time of report he had good motion in one leg and his arms were improving.

CASE XVIII.—Church and Eisendrath<sup>26</sup> report a fracture of the fifth and sixth cervical vertebrae. Complete paralysis of both upper and lower limbs and of the thoracic and abdominal muscles was present. Complete absence of superficial and deep reflexes, there was turgidity of the penis but no priapism. Laminectomy, 20 hours after injury. Death eight hours after operation.

CASE XIX.—The same writers<sup>27</sup> report a case of fracture of the body and laminae of the fourth cervical vertebra with complete paralysis of the limbs and trunk, and absence of the patella reflex. There was marked priapism without seminal emission, retention of urine, etc. No operation. Death in eight days. Autopsy showed fracture of the body of the fourth cervical vertebra, causing a marked projection into and narrowing of the lumen of the spinal cord. Postmortem findings in this case indicate that operation would probably have saved life.

CASE XX.—M. Baker<sup>28</sup> reports a case of fracture of the articular process of the seventh cervical and first dorsal vertebrae and the cervical vertebra displaced forward; the man lived seven months and nine days. No operation. Autopsy showed the cord crushed opposite to the seat of fracture.

CASE XXI.—Dr. Howard J. Williams<sup>29</sup> reports a fracture of the sixth cervical vertebra in a man of 31, who fell from a moving train. There was complete paraplegia below the third rib with bilateral paralysis of the wrist and fingers, loss of reflexes. Priapism was not observed. The author expresses regret that a fixation plaster dressing was not used, as turning the patient in bed caused almost immediate death from interference with the phrenic nerve, or the branch of the phrenic derived from the sixth cervical nerve.

I have dwelt thus at length upon fractures of cervical vertebra and given the examples with the hope of encouraging surgeons always to try to save life by giving every attention to fractures and dislocations in the cervical region, even though the paralysis be complete and the reflexes abolished below the lesions. Recoveries from fractures of the dorsal and lumbar

region are so common that these lesions are considered quite amenable to treatment. I shall therefore only give a few cases as examples.

CASE I.—Church and Eisendrath<sup>30</sup> report a case with fracture of the tenth and eleventh dorsal vertebrae with dislocation and compression of the cord, in a man of 31, who while driving under a low shed was struck just below the nape of the neck while his body was in an extremely stooped position. There was immense swelling at the site of injury with extensive blood clot under the skin. Complete paralysis below the umbilicus, including paralysis of the bladder and rectum was present. Operation, recovery. There was no laminectomy in this case but reposition by extension and cast.

CASE II.—Baker<sup>31</sup> reports a case with fracture of the twelfth dorsal and first lumbar vertebrae with displacement. Crepitus was felt. Traction by a five pound weight to each foot with elevation of foot of bed. A modified plaster jacket was applied. The patient was able to walk in three months but still had to use a catheter.

CASE III.—Mr. Davies-Colly<sup>32</sup> reports a dislocation backward of the first lumbar vertebra. There were deformity, immobility, and slight paralysis. Reduction by extension and a plaster cast applied. Recovery in two months.

CASE IV.—Lane,<sup>33</sup> reports the case of a boy of 18, who was struck in the back by a heavy iron gate. On admission to Guy's Hospital, he was found to have a deformity of the spine about the tenth and eleventh dorsal vertebrae, between the spinous processes of which a gap existed. The reflexes were exaggerated, he could move his legs with difficulty. Operation showed displacement of the tenth dorsal vertebra forward and downward; so that the cord was compressed between the laminae of the tenth and the body of the eleventh dorsal vertebrae. The interspinous ligament was torn through. Reduction was effected by extension and counter-extension; as the displacement tended to recur the spinous processes of the tenth and eleventh dorsal vertebrae were immovably tied together. The patient did well, but at the end of the second week lateral displacement of vertebra one upon the other took place, severing the cord and causing complete paraplegia. The poor patient was blamed for not lying still. I am convinced that had a proper fixation plaster cast been applied the second accident would not have occurred.

CASE V.—Dr. Andrew J. McCosh<sup>34</sup> reports a case of fracture of the tenth dorsal vertebra

in a man of 42, who fell 30 feet, striking on his back. Paralysis occurred below the waist line. Operation, followed by death in two months from sepsis.

CASE VI.—Dr. E. L. Keyes<sup>35</sup> reports a case of fracture of the twelfth dorsal vertebra in a man of 28 who was struck on the back by the axle of a wagon. Paralysis. Operation. Death.

The causes of fracture of the spine have been mostly given in another part of this paper; falls on the head or neck, falls in which the person strikes on the buttocks, direct violence and gunshot injuries. The crushing force that causes fractures is very likely to cause a dislocation. A not uncommon cause of fracture of vertebra is diving or jumping into the water head foremost, the head striking the bottom. Several cases are said to have occurred at Coney Island a few years ago from this cause.

*Diagnosis.*—Deformity, pain, and crepitus. Crepitus is of course the most important symptom and when present removes all doubt, and while we are not justified in making extension or rotation in order to find this, we can frequently hear it with a stethoscope, or feel it, when it is necessary to move patient. The patient can also tell whether or not he feels any "grating." One point to be observed is that *local symptoms* are of great importance and the best from which to draw conclusions. Pain extending along the line of junction between the sound and paralyzed parts around the body, or along a limb, is a symptom upon which Mr. Ericksen laid considerable stress.

Immobility, in place of preternatural mobility, is the rule, owing to the fact that the vertebral joints are so closely approximated and that fractures and dislocations so frequently coexist. We also judge of the location of the injury, if the cord be affected, first, by the motor paralysis that is present; second, by the cutaneous anesthesia; and third, by the condition of the reflexes. The tables of Keene, Thorburn, Starr, and Mills,<sup>36</sup> regarding the distribution of the spinal nerves, are all open to reference, and, will, therefore, not be quoted. The localization of spinal lesion is probably much more accurate than the localization of lesions of the brain. The

röntgen ray is also more useful in spinal injuries. If the cord be severely injured, as in a transverse lesion, the symptoms appear immediately following the injury; on the other hand, if the injury be partial, as in Case III, an interval will generally elapse before the symptoms develop, these coming on gradually rather than suddenly. In a complete transverse lesion, sensation is abolished below the injury, the paralyzed muscles are flaccid, the knee-jerk is absent. In partial lesions these symptoms are modified; the knee-jerk may at first be absent and later return. Paralysis occurring coincidently with the accident causing the fracture may be due to concussion of the cord. Likewise the symptoms which come on in a few hours may be due to extravasation of blood into theca vertebralis, later symptoms may be caused by myelitis or meningitis. Hence *local symptoms* are most reliable. Priapism is not a symptom of much importance, since it is seldom present. Of the 36 cases of vertebral fracture here referred to, this symptom was only present in two.

Fracture and dislocation are usually associated, and their differentiation is of no clinical importance except that the prognosis is somewhat better in pure dislocation.

**Treatment.**—This may be divided into mechanical and operative. Mechanical is, I think, the method of election in all simple fractures or dislocations. The two patients whom I have personally treated were subjected to this method. Dr. Stimson<sup>37</sup> advocates traction and the plaster jacket as manifestly advantageous, as compared to laminectomy. In compound fractures, or in gunshot fractures of the spine with symptoms of pressure, operation is indicated. In fractures of the laminae with injury to the cord, operation will probably be necessary. If the cord is crushed, the rate of mortality will be high no matter what treatment is adopted. I think it is good sound surgery to operate in any case in which there are symptoms of pressure on the cord, specially so when there is paralysis combined with interference with the bladder functions. It is time to apply ordinary surgical principles to the treatment of spinal injuries, just as we do elsewhere in the body.

The rule formulated by Lauenstein of "waiting for from six to ten weeks, and if, after this time, there is still incontinence of urine and feces, with bedsores, etc., but little is to be hoped for from the unaided efforts of nature," should be considered obsolete. Secondary degenerations of the cord set in at a very early period. According to Chipault<sup>38</sup> these degenerations are caused not by the direct injury to the nervous elements, but probably by their separation from their trophic centers. These degenerations extend both above and below the site of the lesion and begin as early as the fourth day and continue to extend for months, following the general rule of the Wallerian degeneration; that is, the motor fibers degenerate from the site of the lesion downward, and the sensory in the reverse direction. Experiments upon animals as well as clinical experience show that the sooner we operate the better.

Drs. Stewart and Harte<sup>39</sup> have reported a case of successful myelorrhaphy in which they succeeded in bringing together and suturing the ends of the cord, though they were separated three-fourths of an inch.

Total loss of the tendon reflex at the knee is not a contraindication to operation, for if the cord is transversely divided, waiting cannot possibly do any good, operation can do no harm, and may do much good. Laminectomy is not of itself difficult or dangerous and it is best to remove the pressure on the cord. If the cord is severed, clear away blood clot, remove spicula of bone, clean the wound and if possible suture the ends of the cord. Kocher advises waiting to ascertain if the cord lesion is shown to be incomplete in which case he operates. But, as just stated, it is well to operate before degeneration sets in or sepsis takes place from wound infection. In opening the spinal canal, an incision is made to one side and parallel to the spines of the vertebrae. This incision should include five spines, these are severed with bone-cutting forceps at their base. The interspinous ligament is not cut, the muscles are cleaned from the lamina by a periosteal elevator and the entire block of several spines is drawn to the opposite side. The lamina may be removed by

ronguers. If there has been hemorrhage, the dura should be opened and drained, otherwise it is best not to open it. The character of the bed used is of great importance. A water bed or an air mattress are the only kinds admissible. Especial attention must be given to the bladder, a sterile catheter being used every six to eight hours until the bladder function is fully restored.

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CONGENITAL UMBILICAL HERNIA; WITH A  
REPORT OF THREE CASES OPERATED.

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*Frequency.*—The frequency of congenital umbilical hernia is exceedingly rare; Lindfor, in a series of 20,735 births at the Maternity Hospital of Munich, finds one case in 5,184. Rettig reports one case in 5,000 according to records of the Charity Hospital at Berlin. Vierme has not a single case in 3,043 births in the Charity Hospital at Paris. The proportion of this malformation occurring according to sex, is about equal.

*Development.*—A brief review of the embryonic development of the umbilicus and the pathologic anatomy of its congenital hernia is given, in order that clearness and convenience may be afforded a subject not frequently treated in current literature.

The organism at the beginning of its embryonic life is made up of three layers, ectoderm (external), mesoderm (middle) and entoderm (internal). The mesoderm is divided into two secondary leaflets, the somatopleure on the outer side and the splanchnopleure on the inner side. The space which separates these two layers of the mesoderm is named the pleuro-peritoneal; the splanchnopleure is fast to the ectoderm. These two last named layers give birth to the abdominal wall, while the entoderm and the somatopleure together become the intestinal wall. The embryo detaches itself gradually from the blastodermic vesicle during the time its two extremities curl, thereby making more and more narrow the future umbilical space. The intestinal sac and the umbilical vesical, both coming from the blastodermic vesical, communicate with one another by a large pedicle, giving the first indication of the cord; it is the vitellointestinal pedicle which extends from the mouth to the anal membrane and laterally to the center of the flanks. If, at this time, an arrest of development of the abdominal walls takes place,

then we have at birth a large embowelling, allowing the thoracoabdominal organs to be left nude.

*Pathologic Anatomy.*—The cause of embryonic hernias is an arrest of development resulting in a certain number of organs, which should be normally contained in the limited cavity, remaining outside and not recovered by the abdominal walls. The front of the tumor does not have a covering of skin, subcutaneous tissue, aponeuroses, and peritoneum as in ordinary hernia, but usually there is a covering of amnionic membrane separated by a quantity of Wharton's jelly from a very thin transparent envelope which is in direct continuity with the parietal peritoneum. This thin transparent envelope is derived from the primitive membrane of Rethke and exhibits a distinctive character of nonvascularity in part of its area which has been subject to arrest of development, while that portion showing vascularity in the living subject conforms closely to poorly developed peritoneum. The membranes adhere to one another very frequently. The cord inserts itself on the tumor proper either at the end or on the left lateral wall.

Embryonic hernias are often accompanied by other malformations as anal artresia, spina bifida, exstrophies of the bladder, polydactylism and club-feet. This fact is illustrated by Case III of our own series.

It is not our intent to review the numerous theories held by observers upon this subject as touching the very interesting query—to what is due this remarkable arrest of development? But rather to set forth some salient and quite well-defined factors in addition to the case records.

*Symptoms.*—The symptomatology is varied according to the size and contents of the tumor, protection of envelopes, reductibility of hernia, and necrotic processes of the leaflets. Tears in the outer linings of the hernia and the intestine may result from severe manipulations. The size of the hernia will be increased in volume by any efforts of the child, such as crying or coughing. When the liver is included in the hernial contents, pressure upon the

tumor causes marked embarrassment of respiration. At birth the outer linings are usually thin and transparent, peristaltic movements are easily observed. The abdomen is completely opened at the level of the umbilical region, and the tumor, which is globular, pyriform, or hemispheric, has the cord inserted at its end or to the left side.

*Prognosis.*—The volume, contents, and adhesions may make the hernia irreducible. Injury to the envelope may induce a rapid degeneration with extension to the peritoneum proper, with resulting general peritonitis. A slow desiccation of the membranes offers the least provocation to peritonitis. A small hernia containing only intestine, without adhesions, and a normal process of mummification of membranes succeeding, admits of a good prognosis.

A carefully performed radical operation done soon after the birth of the child in properly selected cases should reduce the mortality below 25 percent.

Hallet's analyses of 87 cases published between 1882 and May of 1890 give 30 deaths, or a mortality of 34.4 percent. In 61 cases the sac contained only intestine and the mortality was 21 or 44.4 percent. In 24 the sac contained beside intestine a part or the whole of the liver; the mortality in this series being 8, or 33 percent. In two cases in which the heart was contained in the hernia, the mortality was 100 percent.

In 16 cases in which the treatment was expectant, 50 percent terminated fatally, while 71 cases with interference give a mortality of 32 percent.

In our series of three cases treated by radical operation, respectively at four hours, 16 hours and one hour after birth, the mortality was 33½ percent. One patient died from shock four hours after the operation; the other, five days after operation, from peritonitis. In both of these cases the hernias were large and contained both liver and intestines, with extensive adhesions. In the patient living but four hours the intra-abdominal pressure after reduction of the hernial contents was so great as to cause immed-

iate and continuous depression of pulse and respiration.

In patients who have recovered after either the expectant or radical operation plan of treatment, there is apparently a resulting lowered resistance in after months and years against intestinal diseases. In the successful case herein reported, the patient was very frequently subject to gastrointestinal inflammations and lived but three months, succumbing to an attack of mucous colitis.

The prognosis is largely determined in most cases by the first three months of fetal life when the arrest of development occurs.

*Treatment.*—The oldest and simplest method of treatment consists in the application of a compress and bandage which, if successful, secures healing in 4 to 12 weeks. The manner of cure is described as follows: The amnion becomes gangrenous and gradually raised from the granulating inner covering of the hernial sac, the peritoneum. Portions of epithelium sprout from the adjacent abdominal integument which, covering the granulating surface, form a cicatrix over the peritoneum, causing a certain diminution of the hernia by shrinkage. The result is not a radical cure but only a cicatrization of the hernial sac.

This treatment is limited to patients with very large hernial openings and to patients who do not come under treatment soon after birth but still have aseptic hernial coverings.

Simple ligation of the hernial opening after replacing the contents of hernia can be done only in very small reducible hernias.

The Breus operation consists in applying a clamp to the pedicle after reduction and placing three separate sutures just below the clamp; each suture is tied and contains one-third of the sac. This method is very liable to wound surrounding tissues and is applicable only to small hernias.

Olshausen's operation is the best of the extraperitoneal methods: Incision is made through the skin around the hernial sac .5 cm. from the border of the hernia. The incised border of skin is then loosened from the peritoneum, together with the amnion and a

large portion of Wharton's jelly. After the vessels of the umbilical cord are tied with catgut, the freshened edges of skin are united over the peritoneum by silk sutures. This operation necessitates two conditions: (1) It must be done immediately after birth, when the amnion can be distinguished from the peritoneum; (2) the hernia must be reducible. The hernia is not radically cured, but only covered with integument by this method.

The intraperitoneal method of Lindfor's is the only operation adapted for irreducible hernias or those which are difficult to reduce. The contents of the sac are repositied if possible, the hernial sac is opened and resected, the umbilical vessels are tied and the wound edges are sutured through the whole thickness of the abdominal wall, care being taken to unite exactly the fascia and the abdominal wound. The earlier and the more aseptic the operation is done, the more favorable will be the result.

#### OBSERVATION OF CASES.

CASE I.—Baby R., born at full term, September 5, 1903. Delivery was instrumental and without difficulty. Heredity good. Father aged 25, American. Mother aged 22, English; both healthy, no deformity.

The child is well developed excepting at the level of the umbilical region where a large tumor presents as shown in the accompanying photograph. The dimensions are: Lateral diameter 14 cm., largest circumference 26.5 cm., circumference of pedicle 25.3 cm., opening 5.2 by 6.6 cm.; base to point above over tumor 22.6 cm., base to point above over transverse direction of tumor 20.3 cm., base to center of cord 5.7 cm.; skin edge raised on tumor 2 cm. The enveloping sac is largely transparent and shows plainly a large mass of liver and intestines. The circulation and respiration were markedly embarrassed soon after birth but responded well to artificial respiration and mild cardiac stimulation.

Four hours after birth, chloroform was given for anesthesia and reduction tried but failed. Operation was commenced by Olshausen's method but proved inadequate. Lindfor's radical operation was now followed. It was after the most tedious work that adhesions were made free and replacement obtained. Approximation of the wound edges was possible only when great tension was made upon the abdominal walls. A parallel incision in the

right and left abdominal walls was necessary to relax the tension. The liver was densely adherent and separation caused considerable hemorrhage.

After closure of the wound marked depression of the pulse and respiration followed due to the pressure, hemorrhage from adhesions during separation and general shock of the



operation. Death ensued in four hours. Autopsy gave evidence of intense abdominal pressure.

Body-weight is 5 pounds=	2488.2 grams.
Liver.....1542.5 grains=	100.2 grams.
Right kidney..185 grains=	11.9 grams.
Left kidney...141 grains=	9.1 grams.
Spleen.....68 grains=	4.53 grams.

Birch Hirschfield gives the average weight of the liver in the newly born as 127 grams or 26.8 grams more than that of this patient. The spleen was a little more than half the size of the average normal organ.

The right kidney was displaced anteriorly to midway between the lumbar and abdominal walls and laid on the displaced vertebral portion of the diaphragm opposite the third lumbar vertebra and the eleventh rib.

This case would admit of no possibility of cure.

This was the first child of both father and mother; their second child was born a few days ago, one year and seven months after the first, and is without the slightest deformity.

CASE II.—(December 20, 1903.) An illegitimate child, weight 3,235 gm., delivery normal, parents healthy and without deformity; presents a congenital umbilical hernia of the dimensions: Lateral diameter 10 cm., largest circumference 26.5 cm., pedicle circumference 19 cm., opening  $4\frac{1}{2} \times 5$  cm., base to point above over tumor 23 cm., transverse 20 cm., base to center of cord 5 cm.; skin edge raised on tumor 1.5 cm. Both liver and intestine are easily seen through the coverings. Cord is inserted at end of tumor.

Reduction is secured under chloroform anesthesia but is not retained. The Olshausen method of operation is changed to that of Lindfor's because separation of amnion and peritoneum is impossible. A portion of the amnion is left adherent to the liver and allowed to drop back in the abdominal cavity. The abdominal walls are well approximated with silk sutures.

The wound granulates kindly and promises prompt union. On the fourth day peritonitis develops and death occurs five days after the operation.

Autopsy.—The coils of intestine that had been involved in the hernia were matted in a thin adhesive exudate. The abdomen was moderately distended and on section was found to contain considerable rather thick yellow pus, not fecal in odor. Parietal peritoneum was not markedly involved either as shown by adhesions or injection of bloodvessels. The pus contained bacilli and streptococci.

We are indebted to Dr. W. E. Tiffin, of this city, for referring this case to us.

CASE III.—(May 14, 1901.) Reducible embryonic omphalocele about the size of a goose egg, contained parts of three coils of intestine, not adherent to the peritoneum. The pedicle was about the size of two thumbs when placed together and the cord was inserted at the end of the tumor. The coverings were very thin and transparent.

The child presented additional malformation in supernumerary digits and deficient foreskin covering of the penis. Father's health good. Mother had very poor health during the first three months of pregnancy. Her confinement was not difficult and was without incident, excepting it was a breech presentation and delivery. This was the third child of the

mother, all being born at full term. Her two children by the first husband died in infancy from gastrointestinal trouble. They were not deformed.

One hour after birth the hernia was reduced by persistent, yet careful manipulation, and operated by Breu's method. Healing was prompt, good union taking place in eight days. The child showed no inconvenience or disturb-

ance at the cicatrization ring hereafter, but died three months later of mucous colitis.

In the *Philadelphia Medical Journal* of February 23, 1901, was published a series of tables including 90 cases of umbilical hernia, collected from the literature. To these we wish to add the following cases not in any of the tables mentioned.

NO.	SURGEON.	REFERENCE.	SEX.	DESCRIPTION.	TREATMENT.	COURSE.	REMARKS.
91	D'Arcy.	The Lancet, Nov. 24, 1894, page 1216.	Male.	Contained cecum, v. appendix, portions of ileum and colon; about 8 in. of intestine in all.	Radical operation.	Died in 24 hours of peritonitis.	Two days old. Omphalocele in a state of acute inflammation, irreducible. Three operations of bowels since birth. Gut much congested from attachments at u. ring. Adhesions separated. Abdominal wall incised in medium line. Sac cut through at its collar. Intestines washed. Cecum was hard. Replacement difficult. Closure by horse-hair and silver wire.
92	Kessel, Geo.	Med. Record, March 3, 1900.	Female.	Reducible. Contained liver and coils of intestine easily seen through covering.	Radical operation.	Died within 12 hours.	When hernia was reduced pulse weakened; relaxing it grew strong again. Freshened edges were stitched by using silk.
93	Fiske, E. L.	Amer. Jour. of Obstetrics, Dec. 1900.	Female.	Pressure in abdomen; 3 in. longest diam.; contains abdominal viscera floating in an abundance of fluid. Left lobe of liver occupied upper third of tumor.	No operation.	Died immediately after birth.	Mother, Swede, aged 37. Her other five children all living and well.
94	Bilhant, M.	Ann. de chir. et d'orthop., Par., 1901, xiv, 97-102.		Gangrenous abdominal wall. Partial inclusion of liver in hernia.	Radical operation.		
95	Bullard, J. W.	American Medicine, Nov. 8, 1902.	Male.	About one-half of liver in sac coverings showed signs of degeneration.	Radical operation, thirteenth day.	Died in 20 hours.	Nothing removed. Adhesions very firm and all effort to free them was abandoned.
96	LeGentel.	Bull. Soc. d'obst. de Par., 1904, vii, 318.			Radical operation.	Cured.	
97	Patrick, J.	Glasgow M. J., 1904, lxi, 37-39.		Large hernia.			
98	Fournier, C.	Bull. Soc. d'obst. de Par., 1904, 2. S., iv, 69-76.			Radical operation.	Cured.	
99	Flosdorf. ([Hans] Peter)	Giessen, 1904, Von Mûchaw, 52, p. 8.					
100	Flosdorf.						

NO.	SURGEON.	REFERENCE.	SEX.	DESCRIPTION.	TREATMENT.	COURSE.	REMARKS.
101	Lindner.	Monatsschrift, f. Seb. u. Gynakologie. Reported to Vienna Gyn. Soc., June 14, 1905.		Cord is wanting. Bloodvessels run into hernial sac. Considerable lordosis is present and double club-feet.			
102	Crozier, Griffith	Archives of Ped., N. Y.		Size of a small apple. Contained loops of intestines.			Monster. Vault of cranium entirely absent. Brain exposed.
103		Described in the accompanying report.	Female.	Contained liver and small intestines, easily seen through coverings; 26.5 cm. largest circumference. Base to point above over tumor 25.3 cm.	Radical operation.	Died in 4 hours.	Operation under chloroform at age of four hours. No other malformation. Body cavity relatively small. Great difficulty in closing hernial opening. Liver adherent to sac wall and is reducible only with great difficulty. Child weighed 2488.2 gm. Liver " 100.2 gm. R. kidney " 11.9 gm. L. " " 9.1 gm. Spleen " 4.53 gm. Right kidney displaced anteriorly. Second child born one year and seven months after is not deformed.
104		Described in the accompanying report.	Female.	Contained liver and small intestines. Circumference 26.5 cm. Pedicle circumference 19 cm. Opening $4\frac{1}{2} \times 5$ cm.	Radical operation.	Died in 5 days.	Anesthetic, chloroform. Reduction difficult. Adhesion of liver to sac wall extensive. Child [is of illegitimate birth.
105		Described in the accompanying report.	Male.	Size of a goose egg. Contained parts of three coils of small intestines. Is reducible. Cord inserted at end of hernia, coverings very transparent.	Radical operation.	Cure.	Anesthetic, chloroform at age of one hour. Reduction easy. Approximation accurate. Firm union in eight days. Child had supernumerary digits and deficient foreskin on penis. Died three months later of mucous colitis.

The following are references to the literature on congenital umbilical hernia which has appeared since the foregoing copy was written. Circumstances prevent us arranging a convenient tabulation of cases reported during this interim.

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# INSTRUMENTAL EXAMINATION OF THE RECTUM FOR MALIGNANT GROWTHS. A NEW PROCTOSCOPE. SOME SUGGESTIONS ON THE PALLIATIVE TREATMENT OF INOPERABLE GROWTHS.<sup>1</sup>

BY

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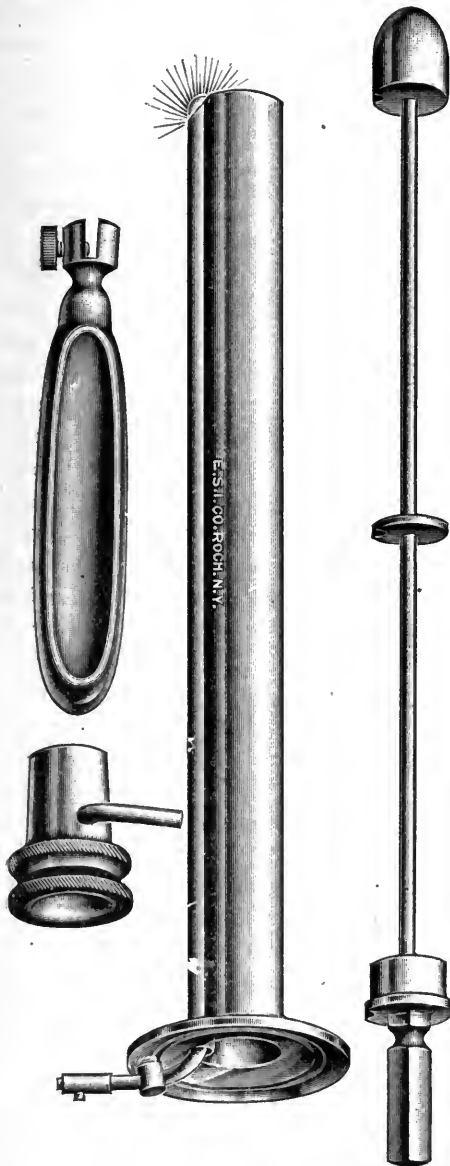
In a paper read before the recent meeting of the New York State Medical Association, I reviewed the subject of "Carcinoma of the Intestinal Tract" devoting most of my time to diagnosis. My chief plea in that article was for prompt resort to instrumental examination and early exploratory operation in all cases presenting subjective symptoms such as point to the possible existence of malignant diseases of the intestinal tract. By "subjective symptoms" I meant, digestive disorders, pain, loss of weight, cachexia, increased peristalsis, nagging griping of the intestine without adequate fecal discharge, an increased tendency to pass gas and later obstipation. I further stated that delay in diagnosis until blood and mucus were being discharged from the rectum or until a well-formed tumor could be mapped out in the abdomen was fatal in the majority of cases because these conditions are only found in the late stages of malignant diseases. May I here repeat, *the only hope for sufferers from malignant tumors of the bowel lies in the recognition of the possible meaning of the subjective symptoms, and the earliest possible resort to instrumental examination and exploratory operation, if necessary.* To forestall all argument with regard to the comparative advantages of instrumental and digital examination let me say that all the instruments ever devised do not compare with the well-educated finger in the diagnosis of malignant neoplasms, in the first four or five inches of the rectum. This "probe with an eye" gives us a knowledge of the existence of a neoplasm, its site, its size, its density, its conformation, its mobility, the area it involves, its effect upon the intestinal caliber and all its characteristics except color, and no inanimate

instrument could possibly afford such information. The finger, however, is not so accurate in the diagnosis of simpler conditions such as ulcerations, prolapses, congestions, simple inflammations, etc., nor can it penetrate beyond the lower four or five inches of the intestinal canal. In these conditions and above this area we must have resort to instrumental aids in the diagnosis of intestinal diseases. It is true that under general anesthesia, one may introduce the hand into the rectum and thus examine the entire sigmoid flexure with the fingers, but this operation is limited to a very few surgeons; it should never be done by anyone whose hand requires a larger size than a 7 $\frac{3}{4}$  kid glove. The muscular and nerve tone of patients suffering with malignant or exhaustive diseases is always below par and overdilatation of the muscle is very likely to be followed by incontinence in these cases, whereas the same dilatation in a healthy individual or one suffering from hemorrhoids or fissure would be practically harmless. This sort of an examination also involves the administration of a general anesthetic. Since the use of ethyl chlorid and nitrous oxid gas this objection is not so forcible as formerly, nevertheless, patients seem to dread it quite as much as the operation. It is my practice, therefore, to use general anesthesia for local examinations only as a last resort. The modern instruments, for examination and treatment of the rectum and pelvic colon, enable us to diagnose [almost any condition in these portions of the intestinal tract without resorting to general anesthesia. These instruments are the proctoscope (rectoscope), sigmoidoscope (romanoscope), the Martin probe, the alligator forceps and the specimen forceps. The proctoscope and sigmoidoscope have gone through a series of developments since the day of Bodenheimer's invention in 1865; it was not, however, until Kelley combined Sims' idea of atmospheric dilation with the straight rectal tube of Andrews that the problem of rectoscopy and romanoscopy was solved. The principles of Kelley and his instrument are so well known that it is unnecessary to describe them here. The illumination depends entirely upon a reflected light and,

<sup>1</sup>Part of the discussion before the German Medical Society, of New York, November 6, 1905.

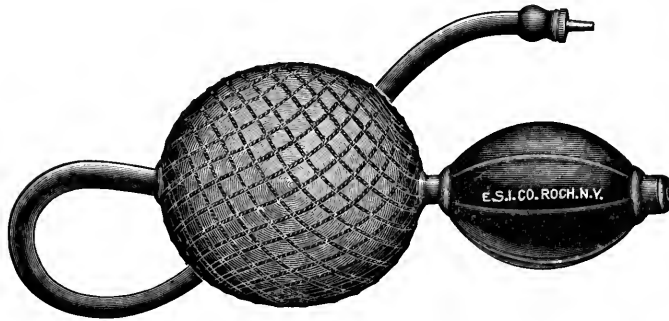
inasmuch, as the angle and direction of the instrument have to be changed at every point throughout its introduction into the sigmoid, one finds it very difficult to keep this light focused throughout the length of the instrument. It was this fact that led to the introduction of an electric

pressure and it was found that in many instances this dilation failed, notwithstanding the patient was put in the extreme knee-chest posture or in a Martin chair. Certain inflammatory conditions, adhesions or neoplasms of the rectum or pelvis prevented the atmospheric dilation and all one could see through a Kelley tube or its immediate successors would be that portion of the intestinal mucous membrane which fell down over the end of the instrument. Artificial dilation, therefore, suggested itself and two instruments were devised by Laws and Pennington which seemed to solve this problem; these are the first pneumatic proctoscopes, so far as I have any knowledge. There were several objections, however, to both of these instruments. and I have, therefore, endeavored to devise means of overcoming them if possible. The result was the now recognized pneumatic proctoscope with its electric lamp enclosed in a glass globe which obviates all burning of the rectal mucous membrane, can be kept absolutely clean and furnishes sufficient light to observe the minutest pathologic lesion in the rectum and sigmoid. The instrument is made in various sizes, from 22 mm. to 33 mm. in diameter and from four inches to 15 inches in length. It can be used with a battery, or with the general street current, a very simple and inexpensive controller being all that is necessary to attach to the electric chandelier above one's operating table. The 24 mm. (12 inch) instrument is the one which is most generally useful and practically supplies all one's needs for diagnostic purposes. A little pocket battery will illuminate the cavity of the bowel perfectly. The obturator is conical, thus facilitating the introduction, and the ground plug containing the glass window and an aperture for the introduction of air is accurately fitted into the proximal end of the tube. The rubber hand bulb serves for the artificial distention when atmospheric dilation fails. In the majority of instances the rectum can be examined without the use of the plug or artificial dilation but the reverse is true with regard to the sigmoid flexure. Here one must generally use the artificial dilation in order to determine the exact course of the gut.



light in the upper end of the tube, thus enabling one to have the light always at the point which was being introduced into the bowel. Successful examination, however, was always dependent upon the dilation of the bowel by atmospheric

The technic of employing the instrument consists first, in putting the patient in the knee-chest posture or on a Martin chair. Success depends entirely upon having the shoulders and chest well below the level of the hips so that the intestine will run up out of the pelvic cavity and allow room for the dilation of the rectum and sigmoid. The left index finger should always be gently introduced through the sphincters and held there for a minute or so in order to overcome any spasmodic contraction. The proctoscope with the obturator in place should then be held with the small glass globe of the auxiliary tube upon the palmar surface of the finger and pressed gently but firmly against this in an upward and forward direction. As the sphincter relaxes under this pressure the finger should be slowly withdrawn and



the tube will slip through the aperture in its place. Once past the sphincter muscle, the only difficulties which occur in the rectum will be an obstruction by the mucous folds or so-called Houston valves. One must wind the instrument around these points, always looking through its aperture to see that the edges do not impinge on the mucous membrane and thus create abrasions which may become infected and lead to unnecessary complications. When the upper limits of the rectum are reached the handle of the instrument is pressed firmly backward against the coccyx in order to pass around the promontory of the sacrum and into the flexure of the pelvic colon. Contrary to what is usually taught in the books, the pelvic colon usually passes off to the right from the rectum; I have time and again seen failures in sigmoidoscopy due entirely to the operator

trying to find the aperture on the left side of the rectum. It is just at this point that the pneumatic proctoscope with the hand bulb serves its greatest purpose, for by withdrawing the instrument a little distance from the point of the sacrum and pumping in a little air one can see the inflation of the rectosigmoidal aperture and thus determine exactly the direction which the proctoscope should follow. In order to carry the instrument around acute flexures in this part of the intestine and beyond the promontory of the sacrum, it is necessary to press back firmly against the posterior commissure of the rectum which sometimes gives considerable pain. This pain can be avoided by the introduction of a few drops of cocain into the sphincter muscle on either side of the posterior commissure; this is unnecessary, however, in the large majority of cases. No force, whatever, should be used in pushing the instrument forward and it should never be advanced until the caliber of the gut ahead is plainly in view. Wherever fecal matter or intestinal discharges obscure the light all that is necessary is to wipe the glass globe off with a pledget of cotton and proceed with the examination. These

examinations can be made in the exaggerated Sims' posture, but this is not nearly so satisfactory as in the knee chest posture. Strauss, of Germany, has devised a modification of this instrument based upon some fancied objections which I have failed to find, but his instrument does not appear to be as substantial or as simple in manipulation as the American proctoscope.

The question of what can be seen through the proctoscope is answered in the few words. "*Whatever exists in the rectum or sigmoid flexure.*" In the early stages of malignant disease there is no ulceration; the mucous membrane itself, is slightly nodular and of a dark color. This can always be observed through the proctoscope and the underlying induration when too far up to be felt by the finger can be elicited by the steel palpator. When the tumor has grown to such an extent as to protrude into the gut in a

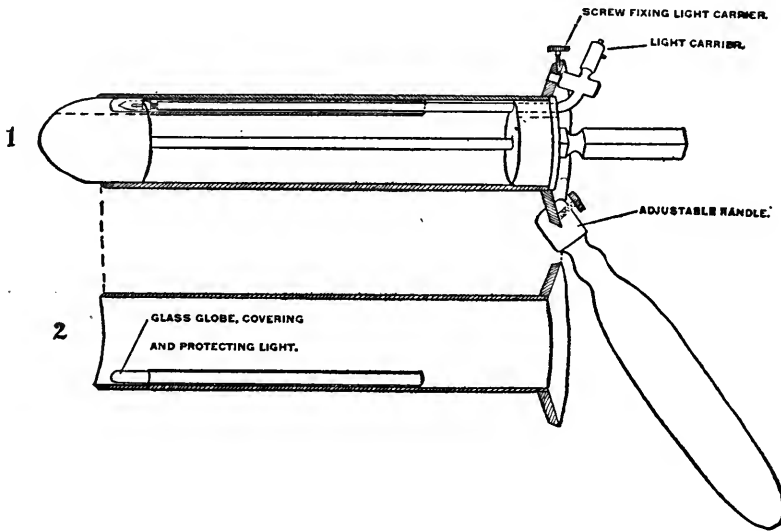
cauliflower-like excrescence, its exact stage of development can be absolutely demonstrated through the aid of the proctoscope. When it is circular and constricting, the remaining caliber and its capacity for the passage of fecal material can be accurately determined.

Where the caliber is too small to admit the proctoscope, the extent of the tumor can be told by introducing a bulbous bougie through the proctoscope and beyond the narrowed caliber of the gut.

The nature of the growths can nearly always be determined by ocular appearance, but if it is desirable to submit the same for pathologic examination, the specimen forceps enables us to

pedunculated polypus but such cases are never originally carcinoma; they are simply polypi in the stage of carcinomatous transformation.

All these variations can be seen and recognized through the proctoscope. *Great care is necessary in the introduction of the instrument in diseased conditions for fear one may rupture the bowel and pass the tube into the peritoneal cavity.* To avoid this danger it is always best to employ the instrument *without general anesthesia* so that the sensations of the patient may guide the operator with regard to the amount of pressure he is employing. To determine the mobility of the growth above the reach of the finger, the Martin probe and the alligator forceps



bite out the specimen from the growth at any point in the circumference of the gut.

The macroscopic features of carcinoma vary greatly in the different stages of development and in the various types of the disease. Sometimes it occurs like a villous papilloma bulging out into the rectum in coral-like excrescences. In other instances it rises up like a small plateau from the mucous membrane and is ulcerated at the center in crater-like form. In other cases in which the entire circumference of the gut is involved and the caliber is almost obliterated, the tumor appears like an eroded or granulating os uteri with very nodular surface. In still other cases the growth may appear as a

are very useful, as one may catch hold of the gut with these instruments and by pulling it upward and downward obtain information regarding its attachments to other organs. The size of the restricted caliber of the gut can be determined by the bulbous bougie but this should be always used with the greatest caution. When the growth is villous or pedunculated, the pedicle can be snared off or bitten out with the specimen forceps and the base cauterized with the electric cautery through the proctoscope, thus increasing the caliber of the gut and facilitating the fecal passages without discomfort to the patient, and with little or no pain afterward, provided the growth is above three inches

from the margin of the anus. In advanced cases in which radical operation is inadvisable this method of palliative treatment, *i.e.*, scraping out and cauterizing, is of great advantage. I prefer this method to colostomy in the majority of cases. It gives quite as much relief without the unpleasant features of an artificial anus and I am quite sure that in carcinoma, the thorough cauterization of the growth after it has been well scraped out, retards its redevelopment and thus prolongs life. I have seen one case in which the area has entirely cicatrized and there are no evidences of the growth except a cicatricial stricture which is kept open by dilation. This operation may be done through the operating proctoscope which is also shown herewith. It differs slightly from other proctoscopes, first, in having an adjustable handle so that the electric cord can always be placed out of the way of the operator; second, in the lamp being protected by a flint glass globe that is not easily broken by the manipulation of instruments. The tube diameter is 29 mm., length 15 cm., lamp diameter 2 mm. and globe diameter 4 mm., thus giving abundant room for the circulation of air about the lamp and preventing it from overheating; it is thus long enough to reach all parts of the rectum and the lower fold of the sigmoid. It is large enough to allow the manipulation of almost any practical instrument in rectal surgery, and yet not so large but that it can be introduced through the ordinary sphincter muscle without great pain. In some of the inoperable cases in which the patients were treated in this manner and who live near to me I watch for the recurrence and cauterize the area from time to time, thus keeping down the local condition and making the patient comparatively comfortable without attempt at radical cure. At the same time, the patients are cheerful and hopeful and are not distressed by the disagreeable features of even the most perfect inguinal colostomy. Thus the sigmoidoscope is not only an instrument for diagnosis in malignant diseases but it is often of the greatest benefit in the palliative treatment of this condition. In a word, the sigmoidoscope has

given us access to the whole exploratory field; we are no longer dependent upon inferences from subjective symptoms and rectal discharges in malignant conditions of the upper rectum and sigmoid, for through its aid we are enabled to look and see and say positively so far as the lower 15 inches of the intestinal canal are concerned whether or not there is any lesion and usually whether that lesion is malignant or benign.

## THE ETIOLOGY AND DIAGNOSIS OF EPIDEMIC CEREBROSPINAL MENINGITIS.

BY

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While it is true that many of the problems, concerned in the etiology of epidemic cerebrospinal fever, have been elucidated by the methods of modern science yet the ultimate factors on which preventive medicine relies are still quite as much in obscurity as they were in the early history of the disease. In its peculiarities of geographic distribution, in the cyclic manner of outbreaks of epidemics, and in the mystery surrounding the origin of these eruptions, the disease has an individuality that has attracted medical men to its serious study. No disease, that we know, has had such wide geographic distribution in its epidemics, accompanied at the same time by such well-defined foci of infection. The first authentic period of this disease was from 1805 to 1830. During these years, cerebrospinal fever appeared at various places in middle and southern Europe and in the eastern part of the United States, and it was even then observed that infected areas were isolated, that is, that two not very distant localities in which meningitis prevailed were often separated by an area where no signs of the disease appeared. The malady was said to occur "*per saltem*," and this peculiarity of epidemic cerebrospinal meningitis has been noteworthy in many of the subsequent periods of the disease.

The chronologic periodicity of the disease is so striking that one would expect the complete exposition of its etiology to explain this fact in

its history. The first recorded epidemic had its origin at Geneva in 1805 and from then to 1830, it was constantly present in some of the southern European cities. In New England it was most prevalent during this period from 1814 to 1816. After 1830, there was a remission of the epidemics of "typhus cerebri," as it is designated in the older literature, until 1840, when it again appeared in France, Italy, Denmark, northern Africa and the United States. The appearance of meningitis in Algiers at this time is remarkable, since the first cases were seen shortly after the arrival of French troops which had come from infected districts, and it was during this same decade that outbreaks of meningitis at Rochefort and Versailles were coincident with the arrival of regiments of soldiers from infected Bayonne. While it is true that these factors prove nothing relative to the mode of transmission of the disease, inasmuch as what might appear as causal may at some time be shown to be only contemporary, yet in the present state of our knowledge, these historic data are suggestive.

The third period of the disease covers the third quarter of the nineteenth century, the geographic distribution being in general the same as the preceding epidemic with the exception that there were fewer immune areas; for example the first cases were reported in Sweden, a State which had heretofore been uninfected. There have been two epidemics since 1875; the last commenced in 1902-3 and has found its victims in Europe and the United States, but nowhere has the mortality been so appalling as in New York and New England, and while this year has shown no exacerbation, the end of this period has not arrived. A glance at the historic chronology of meningitis in any locality would tempt one to prognosticate when epidemics are to appear.

Up to this time, cerebrospinal fever has been confined almost exclusively to the northern hemisphere and with the exception of epidemics in Brazil and Monte Video, which were probably not epidemic meningitis, the disease has found no foothold south of the equator. And this is somewhat remarkable, since the seasons on

which the spread of meningitis seems to depend so much are similar in the south temperate zones. There are comparatively few epidemics of meningitis on record that have not occurred either in the winter or spring. Out of 12 epidemics in Great Britain, 11 have been most active in late winter and spring and the same relative proportion holds true in France. The cases of cerebrospinal fever observed in summer and autumn are usually sporadic.

Of other remote factors in the etiology of this malady, soil and water were formerly considered important as agents in infection, but after a careful study of an epidemic at Lonaconing, Maryland, Flexner and Barker concluded that air, soil, and water may be excluded as carriers of infection. Although we do not know the means by which it is conveyed, yet the opinion appears to be growing that in epidemic cerebrospinal meningitis we have to deal with a disease which is mildly contagious. Within the last year, many Boards of Health have seen fit to place meningitis in the list of communicable diseases, and beside the somewhat suggestive facts mentioned where the path of meningitis followed the line of transportation of armies, it has been a general observation that epidemics spread most rapidly in jails, barracks, and like institutions wherein crowding of numerous individuals and imperfect sanitary conditions are often a feature. Investigations are now in progress to ascertain if the bedbug may act as an intermediary host in the transmission, and reasoning from analogy with what is known concerning some animal parasites, there seems nothing impossible in the idea that the clinocoris might convey a *Diplococcus intracellularis*. Should this be found to be a fact, it would elucidate much of the mystery of primary infection.

Insofar, as it has ever been observed there is no racial immunity to epidemic cerebrospinal meningitis. When an epidemic existed in Algiers, the Arabs appeared quite as susceptible as Europeans and in the United States the disease has spread rapidly in negro districts.

Among the predisposing factors for the contraction of this disease, age appears as most prominent. Epidemic meningitis is a disease

primarily of childhood and adolescence. Of my cases 40 percent were in the first decade of life and 75 percent were under 20, but age offers no immunity; two patients of this series were over 60. Observing the rapid spread of infection among soldiers in garrisons, Rallet was impressed that fatigue is a most important predisposing cause to the contraction of meningitis. While it is true that in adults, this malady is more common among the class whose work would cause physical exhaustion, yet other conditions are quite as prominent; such, for example, as unhygienic abodes and improper food. In children, however, physical fatigue in a pathologic sense is seldom observed and since they furnish half the victims of this disease, and on them the effects of unhealthful surroundings, always evident, are observable in every epidemic of cerebrospinal fever, it is doubtful if much importance can be assigned to this factor.

An infection of the meninges with *Staphylococcus pyogenes* or with the pneumococcus is not uncommon as a terminal event in some of the chronic diseases, for example nephritis, but I have never observed a case of epidemic cerebrospinal meningitis that presented evidence, either in physical examination or at autopsy, of any pronounced chronic disorder, and from that I am led to believe that chronic diseases which usually predispose to infections do not necessarily do so in this condition.

The bacteriologic relations of epidemic meningitis date from 1883, when Leyden demonstrated a diplococcus in the cerebrospinal fluid of patients suffering from this disease. Somewhat later Fraenkel and Hauser showed that the organism isolated by Leyden was identical with the pneumococcus and the frequent prevalence of pneumonia along with epidemics of meningitis lent weight to the idea that the pneumococcus was the bacterial cause of epidemic meningitis. Adenat, in France, and Weichselbaum, in Germany, were able to demonstrate that meningitis, coexisting with crupous pneumonia, is due to the same infecting organism; but even after Weichselbaum isolated *Diplococcus intracellularis* in 1887 from a series of cases of epidemic meningitis the pneumococcus

was still considered the direct invading organism of this disorder. With the accumulation of evidence, however, this conception was abandoned and at present it is generally held that in *Diplococcus intracellularis* of Weichselbaum we have the immediate etiologic factor of cerebrospinal fever. In addition to the evidence of a large number of observers who have cultivated the meningococcus in pure culture from the spinal fluid of patients sick of epidemic meningitis, there is now quite a mass of confirmatory facts in support of this idea of the etiology. Working in Osler's clinic, Gwyn, in 1889, cultivated this organism from the blood of a patient who died from epidemic meningitis. Quite a number of investigators have since confirmed Gwyn's observation, the most notable being the work of Elser, of New York, who was successful in isolating *Diplococcus intracellularis* from the blood in 10 cases out of a series of 41 cases studied. It seems quite probable, as Elser suggests, that with an improved technic the percentage of successful blood cultures will be much higher. It will be recalled that in the early studies on bacteremia in typhoid and in pneumonia the percentage of cases in which the infecting organism could be cultivated from the blood of the living patient was small, but with improvement in method this procedure has acquired a degree of certainty which has brought it in general use as a diagnostic measure. The observation of Warfield and Walker that an ulcerative endocarditis may be due to the meningococcus also suggests a blood infection; and I have noted typical intracellular diplococci in the pericardial exudate of a patient who died of epidemic meningitis.

Perhaps the most important question in the etiology of meningitis with relation to preventive medicine, is the portal of entry by means of which the meningococcus invades the human organism. Bacteriologic studies on the flora of the nose and throat of patients sick with meningitis have led to some belief that the infecting bacterium finds access to the meninges by way of the nose and the cribriform plate. This idea is founded on the fact that *Diplococcus intracellularis* has been found in the nasal dis-

charge of individuals suffering from meningitis, but this may be capable of another interpretation than the one mentioned. There is a possibility, as Elser has explained, of a secondary infection of the throat and nose from the brain by way of the lymphatics, the flow of lymph being from the brain outward. It is also questionable whether some of the reported instances of the finding of the meningococcus in nasal secretion are correct, since it is now recognized that *Micrococcus catarrhalis*, which is frequently found in the nose and throat, is differentiated from the meningococcus only with difficulty. The recent report of a commission deputed by the German government to study the mode of infection in epidemic cerebrospinal fever, is of interest in this relation. The report is based on the careful study of 29 autopsies of which 22 were children. The conclusion of the commission is that infection starts in the pharyngeal tonsil and gains access to the cranium through the sphenoid bone; traveling along the vessels which run through this bone into the sella turcica, the pituitary body is the part of the brain first affected. The infection travels by means of the lymph vessels rather than the blood stream and there is no evidence that it enters the cranium through the cribriform plate.

This conclusion, founded as it is on very careful work, cannot be accepted, however, as the last word on the subject. The portal of entry of this infection may be, as many now believe, the nose and throat, but as yet conclusive proof is quite lacking. This is, perhaps, the most important subject that confronts us at present since it holds the key to the mode of transmission of this malady. No effort at prevention of epidemics, nor of limiting their ravages can be intelligently directed until we know where, in the human organism, the infection first wins its foothold. There is no evidence to lead to the belief that, like the pneumococcus, the meningococcus is a constant inhabitant of the nasal cavity. Nor do there appear to be any well-defined permanent foci as is the case with some of the epidemic plagues. All these questions are of vital importance and each contribution to our knowledge here is of the highest value.

*Diagnosis.*—The mode of onset of epidemic meningitis is so various, particularly in adults, that only in times of a prevailing epidemic when every peculiar symptom excites suspicion are the initial manifestations of diagnostic purport. In illustration of this statement, a few citations from my series may be interesting: In Case XVI, the patient fell in a convulsion on the street and was brought to the hospital in a police patrol wagon. This was in the late afternoon, and according to one of his family the patient had appeared in his usual health at noon. In Case XLI, the patient, an elderly man, had been under treatment for uremia at his home during the week previous to admission. The disease picture suggested uremia. In another case, there was a chill followed by coma and rapid development of edema of the lungs, death resulting within ten hours from the time of onset. On account of hematuria, the physician in charge of this case sent his patient to the hospital with the diagnosis of acute nephritis. The only noteworthy feature that is at all general is the suddenness of the onset. In adults, the first symptom in many cases is headache of an unusually severe character, while in children I have found vomiting and convulsions about equal as the initial symptom of the disease.

While some of the first manifestations of epidemic cerebrospinal meningitis may bear a resemblance to typhoid fever the rapid development of the malady to its full virulence, a matter of a few hours only as a rule, is distinctive. The convulsion, or the headache, which ushers in the attack is quickly superseded by a wild delirium or a comatose condition, which along with the physical signs at this stage, usually makes a diagnosis easily possible. One of the most constant of the early signs, is photophobia which is often accompanied by a conjunctivitis. Later there is not infrequently, a purulent discharge from the eyes and occasionally pus may be observed in the anterior chamber. I have twice noted complete destruction of an eye; this appeared at autopsy to be due to an extension of the inflammatory process from the base of the brain along the pia arachnoid of the optic nerve. An implication of the motor nerves of the eye

in this manner is evidenced by strabismus which occurs in about 30 percent of the cases, or there is sometimes a peculiar rhythmic nystagmus. The pupils are not characteristic further than sometimes showing a disturbed innervation; they may be normal, contracted, dilated or unequal.

In some epidemics of meningitis, skin rashes are found in the majority of cases while at other times they are exceptional. When present they are, along with the other signs, a great aid in diagnosis. The spots vary from small petechias to purpuric areas, the size of the hand. The latter, however, are exceptional. The purpuric eruption of meningitis, while it has the same distribution as the "rose spots" of typhoid, shows no other resemblance nor is there any chance for confusion with the "mottling" of typhus fever.

Of the signs of meningitis those which have to do with the nervous system are of the greatest aid in arriving at a diagnosis. I have never failed to observe a more or less pronounced spasm of the neck muscles causing either rigidity or retraction of the head. The increased muscle tone often extends to the muscles of the back and limbs and with children this results in an attitude which is characteristic, the child lying on the side, head retracted, back arched, and the thighs and legs flexed. The phenomenon doubtless has something to do with the increased intracranial pressure. Any attempt at passive motion of the head or limbs is apt to cause signs of acute distress, and this hyperesthesia, usually most marked to pressure on the back of the neck and down the spinal column, is often shared in by the whole body surface. A cutaneous vasomotor sign, the "tache cérébrale" of the French, has no diagnostic significance. The deep reflexes depend somewhat on the stage of the disease; at the onset the knee-jerks are not infrequently active while later they cannot usually be obtained; of 50 cases the knee-jerks were absent in all at some period during the course of the illness but the variability of this sign detracts from its significances. With adults, a more constant phenomenon is the sign described by Kernig. (When the thigh is

flexed to a right angle with the trunk the leg cannot be fully extended upon the thigh as normally.) Kernig's sign cannot be secured with young children, but in adults, its presence, along with headache, are sufficient to excite suspicion. In an unusual case, Kernig's sign and some retraction of the head were the only physical evidences during the course of the disease; and the patient complained of no symptom other than slight headache. Probably no thought of meningitis would have arisen in this case had there not been an epidemic at the time. A defect in the nerves of special sense is not uncommon; one case of blindness and two of deafness are known to me, but on account of the mental condition, involvement of these nerves must often be determined by examination of the eyegrounds and eardrum. In those exceptional cases in which lumbar puncture withdraws a clear fluid in which no bacteria can be found, careful ophthalmoscopic examination is indicated, because a tubercle in the choroid is sometimes the only clue than can be found on which to base a differential diagnosis.

The physical signs found on examination of the lungs may lead to diagnostic error, for in adults there is usually some degree of pulmonary edema, which along with other clinical facts might well give the idea that one has to do with an early case of pneumonia; on the other hand it must be borne in mind that pneumonia in children produces a disease picture which is sometimes differentiated from meningitis only by the most careful examination. In either case, careful consideration of signs of nerve involvement, *i.e.*, hyperesthesia, reflexes, Kernig's sign, and stiffness of the neck, will usually make a diagnosis possible.

There is no characteristic febrile reaction in epidemic cerebrospinal meningitis as in typhoid or miliary tuberculosis; while some patients, during long illnesses, have almost no fever; other cases run an uneven temperature ranging from 104° to 105°, often of a remittent type, but at times intermittent with periods of subnormal temperature. No diagnostic data can be derived from the temperature chart and this is equally true of the pulse.

In differentiating from typhoid fever the blood-examination is of assistance since a pronounced leukocytosis is the rule in meningitis, but when pneumonia is in consideration the estimation of the white blood cells offers no help. As is true of other conditions the leukocytosis is usually higher in children than in adults. An average of 50 cases including all ages is 32,000. Blood cultures have at present a scientific interest only, as the technic is not sufficiently perfected to insure dependable results. In repetition, then, of what has been already said the diagnosis of epidemic cerebrospinal meningitis must depend in the main on the results of physical examination of the patient, wherein the more important signs to be considered are the condition of the eyes, the skin, sensory disturbances, altered reflexes, and the Kernig sign. But no diagnosis can be certain until lumbar puncture has been done and the meningococcus found in the cerebrospinal fluid. So much has already been written on the method of performance of lumbar puncture that no mention of it need here be made; a moment's study of a human skeleton suffices to give anyone the principle involved. The fluid withdrawn is usually turbid, often it is thick yellowish pus; a drop of this material is spread on a glass slide stained with methylene-blue, and examined with the microscope. The finding of intracellular diplococci confirms the diagnosis, but it is always advisable to stain a second preparation by Gram's method; the meningococcus is Gram-negative. In some cases, the cerebrospinal fluid is almost clear, only a few cells being found in it and at such times it is advantageous to collect the fluid in a clean centrifuge tube and by centrifugalizing to precipitate the cells. In using this precipitate from a larger volume of fluid, the cocci are more readily found, but this procedure is only occasionally necessary as the organisms are usually numerous. The technic of growing the micrococcus in artificial media cannot well be carried out, except in hospitals, but when it is desirable, the best medium for cultivation is a mixture of bouillon and ascitic fluid.

In some of the diseases mentioned in consider-

ing a differential diagnosis from meningitis, the resemblance is more theoretic than real. The disease picture of meningitis presented is almost always clear cut and unmistakable but cases do occur which are puzzling. The presence of albumin and blood in the urine in some fulminating cases of meningitis, together with coma, pulmonary edema, and Cheyne-Stokes' respiration suggest a uremic state but a careful consideration of the physical signs, the reflexes and the blood-examination give indications of the condition that can be confirmed by lumbar puncture.

In meningeal hemorrhage, there are sufficient signs in the age of the patient, the presence of arterial disease and evidences of localized cortical disturbances to render diagnosis usually easy. Two procedures, however, are most valuable in diagnosis. The blood-pressure is almost invariably high, 250 to 300 mm. of mercury being common, and second, if lumbar puncture is done the fluid recovered is blood tinged. It is but seldom that meningeal hemorrhage will enter into the question of differential diagnosis from epidemic meningitis. Brain tumors and brain abscess have some remote resemblance to meningitis though it is doubtful if either be ever a cause of confusion. The history of the onset, the protracted and characteristic vomiting with localizing signs, are sufficient to distinguish them.

The so-called meningitis serosa dates from some definite cause, as an injury, and in the indefiniteness of its course presents few similarities with the disease under consideration; but not so with tuberculous meningitis which, in children, who have not been seen at an early date in the illness, may present all the clinical manifestations of the epidemic form and the diagnosis can then only be made by finding some definite tuberculous focus or recovering tubercle bacilli from the spinal fluid. When tuberculous meningitis is seen during its whole course, there are some distinguishing features, such as the insidious onset and the periods of amelioration of symptoms, followed by recurrences. Sporadic cases of meningitis due to infection with the pneumonia diplococcus

or other pyogenic organisms cannot be distinguished from epidemic meningitis by any means other than finding the invading organism in the spinal fluid. The presence of a concurrent pneumonia gives no absolute aid, since a pulmonary consolidation occurs occasionally in epidemic meningitis.

In their psychic disturbances certain forms of acute delirium, which are manifestations of some diseases, are not unlike the mental states presented by cases of leptomeningitis. Of these conditions the more conspicuous are the delirium which occurs at the onset of typhoid fever, the coma vigil of typhus, and acute alcoholic mania. Their similarity hardly extends beyond the mental state, however, and with due care in the examination, error in diagnosis is not likely.

In times of a prevailing epidemic, when the malady is constantly in mind, error in diagnosis is unlikely to occur. It is the cases which are studied at the beginning of epidemics and which are often of a mild and anomalous type that escape recognition. Here it is not so much that the symptoms and signs manifested are not characteristic as it is that their significance is not grasped. This is often due I believe to a preconceived idea of the illness. The diagnosis of epidemic meningitis is always relatively easy to one who makes a thorough examination and approaches his case with an open mind.

**URINE SEGREGATION BY MEANS OF KIDNEY  
MASSAGE. REPORT OF A CASE OF TU-  
BERCULOSIS OF THE KIDNEY, WITH  
SPECIAL REFERENCE TO THE  
IMPORTANCE OF CYTOLO-  
GIC EXAMINATION OF  
URINE SEDIMENT.<sup>1</sup>**

BY

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of Ann Arbor, Michigan.

My attention was called to a somewhat unique method of urine segregation several years ago and I determined to make some investigations along this line, should the opportunity

NOTE.—Read at the Jackson Meeting of the Michigan State Medical Society, June, 1906.

<sup>1</sup>From Dr. Cowie's Private Laboratory.

ever present itself to me. It was my good fortune a very short time after this to have a patient enter my private practice, complaining of stomach symptoms, the examination of whom revealed an associated pyuria which ultimately proved to be of tuberculous origin.

The difficulty of ureteral catheterization for diagnostic purposes is so great, particularly in the male, as to make its general employment a matter of great reluctance on the part of the general practitioner, who should be thoroughly familiar with the methods that lead to definite genitourinary diagnosis. Indeed for the specialist any simplification of present methods, which carries with it a diminution of the risk of ureteral infection,—a risk which accompanies all instrumental ureteral manipulation,—should receive thorough investigation even though it may prove to be less expeditious.

Several years ago, Giordano, a Venetian surgeon, while performing an operation for removal of the kidney, noticed that when the kidney was drawn into the wound by the usual manipulation, the first urine that passed, after the operation, contained blood. From this he conceived the idea of externally kneading the kidney, with the hope that if products of inflammation were present they would be caused to flow down the ureter and appear in the urine. He practised his method in a case of renal calculus with positive results. Nicolich soon after verified Giordano's findings by means of a very slightly modified technic.

A brief history of my case is as follows:

John R. M., a student, aged 24, came to me February 24, 1904, complaining of distress in the stomach after meals, a heavy feeling in the epigastrium at various times, and occasional eructations of gas. These symptoms had bothered him for many months. There had never been vomiting, and the pain had never been acute. No loss of weight.

*Physical Examination.*—Well-developed musculature, large frame. The skin is sallow over the body. The face has a distinctly muddy hue, the lips are thick and there is nasal obstruction. The panniculus is thick. No edema.

The chest is large and well formed. The supraclavicular spaces are full and the epigastric angle wide. The expansion is good and sym-

metric. Auscultation and percussion are negative.

**Heart.**—The apex beat is inside the nipple line, fifth intercostal space. Dulness is not increased. There is a faint diastolic murmur at the aortic area. Otherwise the auscultation is negative.

The abdomen is on a level with the ribs. symmetric. Inspection is negative. There is slight tenderness on pressure over the epigastrium, otherwise negative. The kidneys cannot be felt. The liver and spleen are not enlarged. Distention of the stomach with air shows the greater curvature two fingers' breadth above the navel, the lesser curvature cannot be made out. Prostate negative.

**Result of Stomach Analyses.**—Achlorhydria, absence of pepsin and rennet, presence of pepsinogen and renninogen, total acidity reaching as high as 18, large amount of mucus. Several meals.

**Urine Analyses.**—February 24, 1904. Fresh sample. There is uniform cloudiness immediately after micturition. Slightly acid. Albumin one-ninth per volume. Sediment contains large numbers of leukocytes, no blood, no casts. He says that this cloudiness of the urine has been present for a long time. It has never caused him any discomfort. He consulted a physician about it and it was thought to be of no serious moment. He has not given it much attention of late. He has had no venereal disease.

February 25.—Fresh urine cloudy as before. The pus is made up of large numbers of mononuclear leukocytes.<sup>1</sup> The majority seem to be of this type. No acid resisting bacilli found. From now on the urine was examined every day for acid resisting bacilli. They were suggested by the mononuclear leukocytes. None was found.

February 29.—Fresh urine collected in three tubes. Each tube is uniformly cloudy, albumin and leukocytes continue as before. No acid resisting bacilli can be found.

**Diagnosis.**—Chronic mucous gastritis and a provisional diagnosis of tuberculosis of the genitourinary passage, probably of the kidney, was made.

March 9.—Fresh urine collected in three tubes. All of the same cloudiness. There are a number of small floaters. These are made up of leukocytes, many of which are mononuclear. One large bunch of acid resisting bacilli.

Resistant to 25 percent nitric acid ten minutes and to alcohol.

March 12.—Mononuclear cells as before. One thread. No acid resisting bacilli.

March 18.—Fresh urine shows only very slight cloudiness and only a very slight ring with Heller. Washed sediment shows many acid resisting bacilli.

March 19.—Fresh urine shows only very slight cloudiness and only a very slight ring with Heller. Washed sediment shows many acid resisting bacilli.

March 19.—Fresh urine collected in four tubes. All tubes have the same turbidity which quickly settles to the bottom leaving the supernatant fluid perfectly clear. The centrifugal sediment washed with distilled water. Two slips examined carefully show large numbers of mononuclear leukocytes but no acid resisting bacilli.

March 21.—Fresh urine shows only a very slight cloudiness. No albumin.

March 30.—Urine turbid. No albumin. Sediment contains comparatively few leukocytes.

**Kidney Massage Experiment.**—The bladder was washed with sterile water until the water returned perfectly clear. The patient was then turned on the right side and the left kidney massaged vigorously five minutes, by kneading, grasping the abdominal wall in the region of the kidney between the thumbs and fingers of both hands and pressing high up under the ribs, having the patient take a deep breath and while it was held the kneading continued. Percussion was performed by having the back made tense. All forms were applied directly over the kidney region.

A catheter was introduced but no urine flowed. The bladder was washed with 125 cc. sterile water, and the water collected in a sterile flask. It was very turbid.

The patient was now turned on the left side and the manipulations repeated for six minutes. No urine followed the introduction of the catheter. The bladder was washed as before and the water returned practically clear. There were a few shreds of mucus containing some leukocytes having the same character as those from the opposite side.

It was very easy to demonstrate tubercle bacilli in the sample from the left kidney and the leukocytes were very numerous, large numbers being of the mononuclear type. No bacilli were found in the urine from the right kidney. This was in all probability, an exception to what might be looked on as the rule, as the material recovered was doubtless from the left kidney, and it should be expected that a few tubercle

<sup>1</sup>The term mononuclear leukocyte is used synonymous with mononuclear cell, and not in the generic sense.

bacilli would be found. The presence of a few cells in the washings after the massage of the right kidney in no way militates against the value of the test. Indeed it might have been done away with very easily by performing the kidney massage on each side, on separate days, thus giving the affected side a period of rest. In the event that no collection of pus was obtained by the first massage, a collection after the second would be positive evidence of disease of that side.

*Tuberculin Test.*—One milligram of tuberculin was injected at 10:30 a. m., April 17. Two hours later, the patient complained of nausea. This was soon followed by intense vomiting which recurred at intervals of 15 or 20 minutes for about two hours. At six p. m., he began to complain of pain in the small of the back. His breathing was labored, eyes were injected, face flushed, temperature 102.6°. The pain in the left small of the back grew very severe but gradually subsided toward morning when the temperature reached 99.4°. At this time the general symptoms had disappeared and he was feeling quite comfortable.

April 20.—Urine obtained the morning after the tuberculin test was dark yellow, turbid, sediment on standing, one-half inch, albumin nearly half per volume, almost pure pus. There were large numbers of mononuclear leukocytes and many polynuclears. Acid resisting bacilli were easy to demonstrate, all forms, many of them beaded and they occurred in large groups and isolated. Their resistance is high to nitric acid and absolute alcohol.

April 21.—Fresh urine one-fourth per volume albumin. Acid resisting bacilli same as yesterday.

Left nephrectomy was urged, but was not permitted. The patient, however, promised to return at the end of a year. During the interim he sent his urine to me from time to time. It continued to be cloudy up until a few weeks of his return, after which it remained perfectly clear, without sediment. After his return it was examined every day for several days; during this time, not a mononuclear leukocyte could be found, and there was nothing in the urine to suggest kidney disease. The operation was still urged and on June 21, 1905, Dr. Darling and I operated. Lumbar incision was chosen. We had great difficulty in getting the kidney into the wound; it was only by means of a gauze sling that we succeeded. When the kidney came into view its appearance was that of healthy tissue, indeed it was so normal in appearance that the question of dropping it

back was suggested by one or two present. Neither of these men, however, had seen the patient before. The operation was undergone entirely upon my initiative and in view of present data contrary to tuberculosis, it seemed that possibly a mistake had been made and that possibly if tuberculosis was present it must be on the opposite side, in some of the structures below the kidney, or in some other part of the body. However, when the scalpel was thrust into the median line large quantities of typical semifluid pus escaped with spurt. The kidney was removed with some difficulty owing to adhesions and the lumen of the ureter treated for an inch of its length with 95 percent carbolic acid, ligated, and dropped into the wound. After thorough flushing of the cavity it was closed and drained.

Examination of the kidney showed it to be lobulated on both sides. The capsule was not adherent. There were no miliary spots. When opened, the entire parenchyma was involved in abscess masses; only the interstitial tissue remaining. The pelvis was completely filled in with granulation tissue, thus blocking off the ureter completely, explaining the absence of signs in the urine, and practically assuring absence of infection below.

The patient made an uneventful recovery with the exception of a slight sinus which persisted for many months but which is now perfectly healed. He has suffered no inconvenience from the loss of his kidney, as it had ceased to functionate long before it was removed, and the right kidney had gradually developed compensation. The urine has continued to remain clear since the operation and there is at present no indication of further tuberculous involvement. The patient feels perfectly well.

Since Widal's paper in 1900, very much has been written concerning the importance of cytologic examinations of pleural, spinal, and synovial exudates. It is now well established that when these exudates are of tuberculous origin the predominating cells are lymphocytes, and when they are of pneumococcus, streptococcus, or other bacterial origin the polymorphonuclear neutrophiles prevail. On the other hand, very little attention has been given to the cytologic examination of the urine, and especially has this been so since the advent of the tubercle bacillus. Before this time, caseous bits and elastic tissue were sought for, and much importance was attached to these. Pus in the urine

has generally been spoken of simply as pus, without any particular reference to the character of the cells that compose it. Pus from the kidney was and still is differentiated from pus having its origin in the bladder by the degree of preservation of the cell form. The urine in tuberculosis of the kidney being usually acid has not the tendency to disintegrate or distort the cell as does the ammoniacal urine which is so characteristic of cystitis, particularly of that in long-standing cases. This fact, which enables us to study clearly the morphologic characters of the cells in almost all cases of kidney inflammation, has been set aside without any further importance being attached to it. "Pure tuberculous pus" occurring in any part of the body is usually described as "pus consisting of a fine detritus of caseous material, fatty and granular cells, and few leukocytes. More typical pus is produced when mixed infection occurs, but even then the microscopic appearances of the pus are different from those of nontuberculous pus," (Hektoen, Ref. Hand Book Med. Sc., Vol. 1, 46) but no reference to the character of the cells is given.

A careful examination will show that the principles that hold true in serous cavities obtain in the urine, and were recognized long before present-day cytologic investigations were commenced. We have been teaching this in the medical clinic of the University Hospital for years, at least as long ago as 1894, the stress being put upon the importance of fishing out small particles from all urines, examining their macroscopic and microscopic appearance, expecting in caseous looking bits to find many cells of the mononuclear type associated with tubercle bacilli. If mononuclear cells were found, it meant search for tubercle bacilli, the same as the finding of casts prompts us to test for albumin or *vice versa*. The two have always gone hand in hand. Accordingly it was not with little surprise that I found a diligent consultation of textbooks, reference books, and journals, fruitless in disclosing any knowledge of this valuable accessory to genitourinary diagnosis.

Dr. Warthin informs me that in 1894 he examined a number of cases of gleet of long

standing and found in the threads many mononuclear cells. This is an important point, worthy of further elucidation and should be borne in mind when attempting a differential diagnosis.

It must be remembered that the sediment of tuberculous urine is not entirely made up of mononuclear leukocytes. They are frequently in excess of the polymorphonuclears. Any goodly number should always suggest tuberculosis. If the character of the cells were determined in every urine showing an excess of leukocytes, tuberculosis of the genitourinary passages would frequently be diagnosed earlier than it often is. In an acid urine, even without washing the sediment, particularly if the urine is fresh, ordinary staining with Loeffler's methylene blue will show the nuclear bodies sufficiently well. Some cells stain poorly because of degenerative changes in their nuclei. A certain amount of care should be always given to the preparation of urine sediment for staining. The spread should be thin, so that the cells will be isolated as much as possible from one another. This refers more particularly to centrifugal sediment. Floaters, or crumb-like bits, after draining off the excess of urine with pieces of filter paper placed simultaneously on either side to balance the capillary attraction, can be teased gently, slowly dried, fixed in the ordinary way and stained. For closer cell study, Wright's stain, or better hematoxylin and eosin may be used.

This case also illustrates the value of the tuberculin test, not only as a means of proving that tuberculosis is present in the body, but of determining its location. Almost always, particularly if a moderately large dose is given, a local reaction occurs. The tuberculin test, in this case, proved the origin of the mononuclear cells, the identity of the bacilli, and verified the disclosure of the kidney massage.

**Agreement on Vaccination.**—The Health and School Boards of Altoona, Pa., have reached an agreement over the enforcement of the vaccination law. Instead of the Health Board's physician performing the third vaccination, it may be done by the family physician in the presence of the Health Board's physician, according to the ruling of Dr. S. G. Dixon, State health commissioner.

LOCAL BLOOD-LETTING IN THE TREATMENT  
OF DROPSY OF CARDIAC ORIGIN.

BY

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of Seattle, Wash.

It is extremely desirable that every aggressive as well as every conservative unit of force available to resist the dropsical tendency in organic diseases of the heart, should be familiar to every general practitioner. A protracted observation of the mortuary records of the Board of Health of Seattle, shows a large preponderance of deaths from organic heart disease over any other one cause of death named in these reports. In many of these fatal cases, the patients followed the typical course of a slow decline under the burden of anasarca, a very painful and wearisome manner of passing the last days of life. The poor patient gets weary and worn to the last degree. The professional nurse, if anything can overtax her disciplined courage, patience and hope, encounters a severe test in these cases; while relatives and friends look on in helpless and hopeless pity or patient service.

Probably the Seattle mortuary record and the Seattle professional experience with cardiac disease and dropsy, do not greatly differ from the situation presented in other cities. Many of these cases prove very obstinate and disappointing as regards therapeutic treatment. Still it is with a feeling of assured reliance upon drug support of the cardiac function that I remove a quantity of vitiated blood and extravasated serum in desperate cases of cardiac dropsy. I do not expect elderly patients who have recovered from dropsy ever to do without the supporting action of some of these drugs.

Possessing, as physicians now do, an effective and varied materia medica for the direct support of the heart, and so-called vegetable trochars for promoting the elimination of effused fluids, it may seem an anachronism to hark back to the long disused and discredited practice of blood-letting. But with all or many of these agents at my side and more or less responsive to my demands, I have yet found desperate cases in which I have been compelled

to seek other aid or witness the steady and painful decline of my patient toward the fatal end.

The therapeutic effects of local blood-letting in these cases of anasarca and ascites have resulted in what appears to me an important discovery. My incisions, chiefly in the legs and ankles, were made at first as a mere palliative expedient for the removal of serum pressing for outlet at the surface of the feet and legs. Blood always followed the knife, for I have slashed freely through the skin and into the deeper fascia, making the incisions with a lateral inclination, especially over the malleoli, from one-half to three-fourths of an inch in length. Following the flow of blood, colorless serum has always continued to be emitted for several days, in some instances copiously and freely, in others more scantily or for briefer periods. Up to the present time, I have made for various patients from 54 to 76 years of age 126 generous incisions, always causing free flow of blood, and never have had a resulting slough or unkindly wound at the point of incision. The wounds have closed and healed only too quickly, except as later and additional incisions have been sooner required, causing thereby more blood-letting and consequent corrective effect upon the blood itself.

In one case, a lady aged 76, after effective incisions had been made, the local swelling again increased to the extent and result of bursting into blebs and blisters under the cuticle, eventuating in ugly and foul-smelling ulcers—a condition which required the free and long-continued use of potassium permanganate solution to sweeten and heal the parts. This had been allowed to occur without my knowledge and by following neighborhood advice which insisted that nature would provide an outlet for the dropsical effusion better than the knife could produce. However, in the close vicinity and presence of these ugly sores, I again cut freely and caused the blood to flow, and these wounds in due time healed kindly and this patient has been well and free from dropsy for over two years, cured of anasarca of the lower limbs, pudenda, back and abdomen. She is now, December, 1906, in the comfortable enjoyment of her faculties nearly three years after both family and professional opinion

considered her moribund from passive congestion of the lungs of cardiac origin, in February, 1904. Blood-letting at the earlier date might have been useful but was not resorted to. Nature indicated this by the bloody expectoration. General and burdensome dropsy succeeded later.

A case illustrating the favorable influence of blood-letting on the renal function was that of an old gentleman, aged 73. When I first saw him he had for the previous six months been oppressed by general dropsy, distended scrotum and largely edematous foreskin. This patient, when I first saw him, said he had passed no urine for more than a month—yet after a few days' medication he did produce a little which I analyzed. He had also blue-black congested toes and feet. All his symptoms were removed or greatly relieved after one bleeding, the result of eight strong, liberal gashes over the four malleoli; shortly afterward urine flowed away "by gallons" as he expressed it.

In one case of extensive anasarca and abdominal dropsy, I left my office provided with a trochar, with which to tap the abdomen, a proceeding to which my patient expected to submit, but in this case the malleolar incisions were substituted, with the result, after patient repetitions of the procedure, full relief of the whole dropsical situation was effected. In another case I did use the trochar, removing 16 pints of heavy albuminous fluid from the abdomen—once only. Later the patient was treated by the local blood-letting method in the legs and ankles and his dropsy was finally cured.

This paper is not intended as a record of cases in which the patients were successfully treated. The impression I desire to make is one of confidence in making free incisions in edematous legs and ankles to let out blood and effused serum. I had no authority for this local procedure, and so far as I know I am original in this suggestion and application. Textbooks generally offer but little hope or aid. If they mention incisions at all it is as a belated resource for the elimination of serum only—and for which acupuncture is often preferred. Scarification is the procedure most recommended but we are warned to delay the measure as long as possible since it is likely to be of little service and may be followed by foul unhealable ulcers. This tendency to the

development of ulcers on the swollen legs has been attributed to the introduction of germs through the broken or incised skin. But the readiness with which scarifications of the feet and legs, and the spontaneous bursting of blisters have developed into ulcerous and sloughing conditions, has in the light of my experience been due less to germs or impurities introduced from without than to internal toxic matters and to obstructed local circulation. The scarifications, acupuncture, and spontaneous bursting give small aid in the elimination of these evils, while deeper incisions with effective blood-letting give great relief.

Sufferers from cardiac dropsy generally preserve a sitting or semierect posture day and night. Breathing in this position is easier. The feet and legs being the lowest most dependent parts gravitation carries the extravasated fluids to them. Hence, the incisions, starting the flow of blood and serum at these lowest points, afford the greatest mechanical and physiologic assistance to nature. While I have found no medical authority or precedent for this form of determined local blood-letting, the classic procedure is recommended by various authors as valuable in certain cases of cardiac dropsy.

I find that Dr. Lepine, of Lyons, France, advocated blood-letting in these cases of dropsy in 1892. He refers to Magendie as showing that absorption of fluid from the tissues is always more active after hemorrhage, and says that on this physiologic datum depends the fact that bleeding which is indicated in certain cases of heart disease, especially when the cavities of the right heart are engorged, may materially assist in bringing about the disappearance of the cardiac dropsy. This is so obvious, that the fact need not be insisted upon; but there is still another way in which bleeding may assist recovery beside this purely mechanical process.

Medical textbooks—although they supply us with scarcely anything but diagrams on this point—insist upon the contrast which usually exists between the urinary secretion in cases of Bright's disease and in cardiac patients. In Bright's disease, the quantity of urine may be

large but the excretion of effete matter is always deficient and the patient is constantly in danger of uremic poisoning, whereas in heart disease, so the books tell us, although the urine may be scanty yet the excretory functions of the kidneys are unimpaired and there is no risk of uremia. This is correct if by uremia is meant an eclamptic attack, but I cannot admit that cardiac patients never show any uremic symptoms. During the last few years, since my attention was called to the fact, I have observed several cases of gradual failure of the heart's action in which the excretion of waste products by the kidney was very defective, although at autopsy the organ presented no pathologic change beyond simple congestion. In spite of the most elaborate staining methods, modern histology is unable to give us any information on the state of a secretory cell, at any rate so far as its functions are concerned.

It follows, that a certain degree of uremic poisoning, slight yet perceptible to the practised eye, is not of such rare occurrence in patients suffering from cardiac inadequacy as was formerly believed, and that it plays a part in the production of the very complex phenomena which are observed in this condition and which so frequently terminate in death. This, to some extent, accounts for the success which attended the practice of the older school of physicians who used to resort to bleeding more frequently than we are wont to do in cases of heart disease. It justifies the application of a method in which we were mistaken in passing an unfavorable judgment because, like themselves, we were not in a position to form a correct opinion of the manner in which its effects were produced.

Dr. Lepine says further: "I think I am not mistaken when I say that in cases of heart disease, the benefit derived from bleeding may be due to the relief of vascular engorgement and to the removal of some of the toxic products which have accumulated in the blood as a result of the failure of the emunctories. There seems to be no doubt that these toxic products are to some extent instrumental in the production of dropsy by weakening the vasomotor center or otherwise. It is a wellknown fact that dropsy

is only induced with the greatest difficulty in a healthy animal."

According to my observation the relief and gain derived from blood-letting from the ankles and legs in cardiac dropsy, are among the most permanent and substantial to be assigned to any therapeutic measure in these cases.

The use of the knife in these cases should cause but little suffering. Ethyl chlorid applied locally soon makes the tissues fairly insensible to pain from the stroke of the scalpel.

But the medical profession and the people of our day are alike prejudiced against blood-letting for therapeutic purposes. They will all say that if there is any good attainable by letting blood there are other and more modern ways of getting the same result. But in most cases, this assertion is a mere empty flow of words for the reason that no real or practical examination of the virtues of blood-letting has been made by one in 1,000 of the physicians now living. The procedure is considered as in bad form and not to be invoked by the up-to-date practitioner. Over 30 years ago, a prominent professor of surgery in an eastern city, who was then doing a private practice amounting to \$30,000 a year, called upon a student in his class to come forward that he might demonstrate the manner of doing a venesection. "For," said the professor, "though we no longer bleed our patients for therapeutic effect it is well that you should be acquainted with the proper way to do it. I have not employed venesection except in this mimic form for the past ten years."

In certain modern medical circles, it would seem that to advocate blood-letting except as a surgical incident is to be laughed out of court, to be classed with the ancient Dr. Sangrados of fiction and fact. But the free lance who ventures practically into this field for the relief of cardiac dropsy may "save his face" in the alternative pursuit of effused serum or of blood until he becomes assured of his own belief in the premises—providing he shall cut deeply enough to secure a sufficient flow of blood. The serum also will flow freely away.

That this paper may not mislead the reader into the hasty conclusion that I am a one-

remedy advocate, it remains for me to indicate somewhat in detail, the *materia medica* and collateral aids upon which I depend for the cure of dropsy. First, I deny my patients the free use of table salt, cider, beer, apples, alcohol, and all articles of diet which may be expected to irritate the kidneys in the process of their elimination. Keep them well nourished as possible by eggs and milk and readily digested foods. Support the heart by caffeine, digitalis, strychnin, strophanthus, crategus, cactus belladonna, morphin, nitroglycerin, etc. I give elaterium, Canadian hemp, and epsom salts to urge elimination *via* the intestinal tract. Have used pilocarpin muriate with some success but always with caution to promote the action of the skin and to invigorate the secretory functions. Have used simple and medicated baths or spongings of the skin to promote eliminative activity. Have watched the condition of the lungs and to avoid any passive congestion also have sought to abate this condition as rapidly as possible after its occurrence, thus keeping that important avenue of elimination open.

I employ all of these therapeutic agents, not in a perfunctory manner, but with a full assurance that they are capable of giving comfort and prolongation of life and with the full conviction that the intelligent and timely employment of these agencies are features of an art just as definitely scientific as the art of surgery can apply any where for the cure of disease.

### GASTRIC DYSPESIAS AMENABLE TO SURGICAL TREATMENT.<sup>1</sup>

BY

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of Superior, Wis.

In dealing with the conditions underlying stomach dyspepsias, in which surgical intervention is indicated, I shall not attempt to treat systematically of diagnostic technic, nor shall I consider to any great extent the symptoms. These can be better obtained from the books.

<sup>1</sup>Read at the meeting of the Western Surgical and Gynecological Association at Kansas City, Mo., December 29, 1905.

My object is to indicate as accurately as possible what the literature, the observation of other surgeons, and my own experience would lead us to expect from surgical principles applied to the alleviation of this distressing and often dangerous class of ailments.

Türk defines dyspepsia as conscious digestion, normal digestion proceeding unawares and without sensation. By this standard it will be seen how comparatively common indigestion really is and how important it is to recognize these cases and to treat the patients along scientific and rational lines. The time was, when the treatment of chronic gastric indigestion or dyspepsia, meant an offhand prescription of bismuth, pepsin, or charcoal or a bitter tonic, with perhaps a mineral acid and a cursory allusion to diet, and with little or no preliminary examination of the patient as to the exact conditions at fault. As a consequence there are chronic digestive disturbances galore calling for daily consideration. Most cases of stomach dyspepsia yield readily to appropriate medical treatment, but there are many patients who have received no benefit from drugs, lavage, electricity, hydrotherapy, exercise, or diet and in whom surgical intervention affords the only hope of restitution.

It is now recognized that many forms of digestive disturbance are dependent upon conditions entirely outside of the stomach and involve the stomach either by direct extension of the pathologic process or indirectly by nerve influence. Among these may be mentioned, inflammatory or irritative conditions in the biliary apparatus, pancreas, duodenum, or appendix, and adhesions of the stomach to surrounding viscera. Within the stomach, conditions remediable by surgical means are perforative and nonperforative gastric ulcer, chronic gastric ulcer, hemorrhage, pyloric obstruction, gastric dilation with stasis (hour-glass contraction), hyperchlorhydria, and cancer. The question of operative interference in some of these conditions is still in dispute, but the wisdom of referring cases of perforating gastric ulcer with or without adhesions, cicatricial stenosis of the pylorus, adhesions of the stomach to any of the

surrounding structures and perhaps chronic gastric ulcer, to the surgeon is now pretty firmly settled.

Mr. Gilbert Barling says: "The patient who gets gastric catarrh from exposure or unsuitable food, the overstrained professional or business man whose poor gastric juice, the result of exhausted nerve force, fails to digest the food placed into the stomach, the poor drudge who has no masticating teeth and is always drinking stewed tea, these are not the people to be treated by surgical operations. If gastroenterostomy were the means by which the greedy could escape the penalties of overeating, or of the eating of food which was wisely prohibited by the physician, what a vista of surgical interference would be opened up."

*Perforating Gastric Ulcer.*—The first condition admittedly demanding surgical operation is perforating gastric ulcer. Although perforations of the stomach are not, perhaps, as fatal as similar lesions lower down in the intestinal tract, still it is the part of wisdom to resort to operation immediately. The cause for the diminished tendency to fatal peritonitis in perforations of the stomach is partly anatomic, but more particularly for the reason that the stomach contents are disposed to be less virulently septic and the microorganisms less numerous than of the pylorus. The numbers of microorganisms and their virulence increase as we proceed down in the intestinal canal until the large bowel is reached when they gradually diminish. (Gilbert and Demenici.)

*Chronic Gastric Ulcer.*—As to the advisability of operating in cases of chronic gastric ulcer, opinions differ widely, some going so far as to say operation is never necessary, that by proper medication, rest in bed and rectal feeding, all patients can be cured. Others contend that gastric ulcer of more than six weeks' duration is essentially chronic and demands gastroenterostomy. Mayo says chronic gastric ulcers are chronic from the start. Perhaps it would be more proper to say that they depend upon underlying conditions that tend to institute and propagate ulcers, and furthermore, operation does not always remove this condition. It is reason-

able to assume in this as in many other conditions, about which there is much controversy, that the medium ground is more nearly correct. Although the contrast between the autopsy findings and the clinical diagnosis of gastric ulcer is most marked as evidenced by various reports in this country, Mayo Robson quotes more recent statistics furnished by Bulstrode, who analyzed all the gastric ulcer cases admitted to the London Hospital, from the beginning of 1897 down to 1902. They were just 500 in number, 98 men and 402 women. Out of this number, no less than 48 (nearly 10 percent) died from peritonitis; 13 (or 2.5 percent) from hematemesis; and 28 (5.5 percent) from other causes. The total number of deaths was 89, or approximately 18 percent, taking all cases together. Startling as this mortality is, it is not all of the ill-effects of gastric ulcer, since there must be a considerable morbidity accompanying nonfatal cases.

Within the last two years I have operated upon seven patients for supposed chronic gastric ulcer.<sup>1</sup>

In four, the indurated ulcer was demonstrated and in three it was not. In all cases, the symptoms clearly indicated ulcer. In no case was the stomach opened and the interior of the stomach searched. In those cases in which no indurated ulcer was found, the patients seemed to receive as much benefit as in those in which ulcer was plainly evident. The immediate cessation of symptoms was established in all cases. Two patients have relapsed within a year into a condition much the same as before operation, although I must say these patients exhibited an utter disregard of any prohibition in the way of diet, probably thinking that as they had had the stomach operated upon they should be able to "eat anything." There was one death in the list. This man was doing well when on the sixth day his wife surreptitiously gave him a hearty meal of grapes and milk, after which he developed pain in the abdomen, vomiting,

<sup>1</sup> Since writing this paper 9 gastroenterostomies, 1 pylorotomy, and 2 Finney operations have been done by me for chronic gastric ulcer, with satisfactory results.

abdominal distention, peritonitis, and died on the eleventh day.

All anastomoses were done by suture, the duration of the actual operation ranged from 13 to 25 minutes, depending upon complications. One bystander remarked, that owing to the ease and rapidity with which the anastomosis by suture could be made, he did not see any necessity for resorting to the Murphy button, the McGraw ligature or any artificial device. I append one case as serving to illustrate a type of this class.

The patient was a woman, aged 30, a stenographer, who had been troubled with painful digestion for about three years. Unless the utmost care was used she would suffer tremendous pain after the ingestion of food and often vomiting occurred. A few times the vomitus contained blood, concealed blood was often found in the stomach contents. All forms of medical treatment, approved and unapproved, had been tried. Her former weight was 150 pounds, but she now weighed 115 pounds. She has always been a hearty aggressive eater. Operation in March, 1905, showed an indurated ulcer about the size of a quarter dollar, on the posterior wall of the stomach near the lesser curvature about two inches from the pylorus. A posterior gastroenterostomy by suture was done, the patient suffered no shock and did not vomit after operation. After leaving the hospital she spent the summer in the west and while there wrote to me that she could eat five griddle cakes every morning. She had gained 29 pounds and her friends now call her "fatty." She is now engaged at her occupation without digestive disturbance.

The principle supposed to be involved in gastroenterostomy for the cure of ulcers of the stomach and duodenum (as they frequently coexist) is an old one. Kelsey, many years ago, recommended and practised left inguinal colostomy for the relief of malignant and benign ulceration about the rectum; and in the urethra, Reginald Harrison called attention to the fact that ulcers and strictures would disappear if the irritating effects of the urine were removed by establishing a deep perineal fistula. And so in the stomach. In consideration of the fact that ulcers occur most frequently in the pyloric third or in the lesser curvature, it was assumed that by making an anastomosis with the bowel

at the most dependent portion of the greater curvature, the food mass would be short-circuited, so to speak, and be permitted to pass into the bowel without coming in contact, to any material extent, with the raw pyloric section. The process of digestion is then supposed to be completed in the intestine and thus pain and pylorospasm due to irritation and overdistention avoided.

Closely associated with ulcer is the sequence of cicatrization and contraction, and when this process involves the pylorus it leads to stenosis and obstruction, and later if this be prolonged gastric dilation and atony will result. Whether the pylorus is obstructed by spasm due to the presence of the ulcer or to hyperchlorhydria, which almost always accompanies nonmalignant ulcer, or to the cicatricial contraction following the healing of an ulcer, it is rendered incapable of readily transmitting its contents, the stomach becomes distended and its muscular walls weakened, leading ultimately to permanent atonia gastrica. Stomach dilation may possibly be due to atony alone, but it is much more frequently due to mechanical obstruction at the pylorus. In this condition of gastric stasis, food may remain in the stomach a day or more, whereas, as Riegel says, it should empty itself within seven hours at most. In fairly advanced cases, when the obstruction has given rise to a compensatory hypertrophy of the stomach, the peristaltic movements may be seen and felt through the abdominal walls, and it is usually accompanied by pain and vomiting; the peristaltic unrest of Kussmaul. Later when the stomach begins to dilate and assume a more passive state, the patient complains of fulness and epigastric pains after meals. Fermentation takes place, causing eructations and heartburn and frequently vomiting. Vomiting is a most prominent symptom when gastrectasia and fermentation are well established. When this sequence of events occurs, there is but one remedy and that is surgical intervention.

*Perigastritis.*—The frequent result of an unhealed gastric ulcer is to set up changes outside of the stomach (a circumscribed perigastritis) which eventuates in adhesions from hardened connecting bands between the stomach, liver,

intestines, or diaphragm, thus crippling the movements of these viscera, preventing the passage of food and giving rise to violent dyspepsia in this way. The following case will illustrate this:

A previously healthy male, aged 47, was a lumber-shover before his health failed two years ago. Since then, what time he has been able to attend to any kind of business, he has been a saloonkeeper. He has drank considerable and has always been a hearty eater, using no judgment either in his manner of eating or in the amount or kind of food eaten. Although he had complained of difficult and painful digestion for several years off and on, still no definite history of gastric ulcer nor other serious lesion about the stomach could be obtained. I might add, however, that in loading boats at this port for lake transportation, he was in the habit of resting the end of heavy planks upon his abdomen about the epigastric region and from there lifting them upon the pile. In this way his stomach or the region immediately adjoining was being continually subjected to mild traumatism. About two years ago, he began having marked distress after meals and this difficulty so increased that he was finally unable to eat any solid food, and was compelled to subsist entirely upon a milk diet using small quantities at a time. His distress came on about half an hour after meals, he rarely vomited, and no material food stagnation existed. His stomach was emptied within the allotted time, even of prune and raisin skins, which showed a patent pylorus. Gas distention was always marked and the greater curvature of the stomach extended to below the umbilicus. Chemical examination of the stomach contents was negative. Although he always complained of distress in the region of the stomach, he had many general symptoms. He tired easily, had tingling in his limbs and could not sleep well; he said he could hear water dripping from his head to his stomach and he had hissing in his ears. In fact he was a typical neurasthenic and had been so treated by half a dozen physicians, but he never improved a particle. So pronounced were his mental symptoms that the question of having him judged insane was seriously considered. Some of his physicians noted that no matter what other symptoms he complained of he promptly reverted back to his stomach. Upon the strength of this he was referred to me for surgical consideration. I determined upon an exploratory operation, which was to involve more particularly the stomach and biliary appa-

ratus. An incision was made through the right rectus muscle and I at once came upon a mass of dense adhesions adherent to the anterior abdominal wall. This proved to be a fold of the great omentum, binding the pylorus and lesser curvature of the stomach to the wall of the abdomen. It was with great difficulty that these adhesions were separated. No further trouble with the stomach was found nor was there any evidence of disease of the gallbladder or ducts. Realizing the futility of the Cargile membrane and the dusting powder to prevent adhesions reforming, and having just read Andrew's method of colon substitution for similar conditions, I accordingly brought up the transverse colon and anchored it between the stomach and abdominal wall. This patient recovered promptly from the operation. Although his digestive troubles as well as his nerve symptoms are much improved, in fact have been almost entirely absent since the operation, November 29, I realize it is too early to pass judgment.

*Hemorrhage.*—Hemorrhage is another condition associated with gastric ulcer which may call for surgical treatment. It is much more common in the acute than in chronic ulcer. While hematemesis is a frequent symptom of gastric ulcer it must be remembered that it is not invariably so. At any rate the stomach has been opened for profuse bleeding and no ulcer found, but instead extensive capillary oozing. W. J. Mayo has called attention to the fact that ulcers may be so minute as to escape detection unless very careful search is made, by bending the mucous membrane over the finger in much the same manner as observing the weave in velvet. The fact must not be overlooked, in this connection, that we may have gastrorrhagia from cirrhosis of the liver, aneurysm, heart disease or other general conditions. It is recommended by Robson and Moynihan that in case operation is resorted to for the control of hemorrhage, that it be limited to indirect treatment by gastroenterotomy and that no attempt be made to find the bleeding point by gastrotomy, unless some obvious spot on the stomach wall is easily accessible. In ulcer of the duodenum and especially when bleeding is a prominent feature as indicated by bloody stools or melena, operation

by pyloroplasty or gastrojejunostomy is clearly indicated. Perhaps the most satisfactory results from operation in this class of cases is obtained when there is slight bleeding frequently recurring, tinging the vomit with blood, or a more or less daily slight hemorrhage into the bowel leading to anemia and ill-health. I have had one such case in a young woman of 23, in whom I did a gastroenterostomy two years ago and the result has since been most gratifying, as she had been practically an invalid for many months before the operation.

*Malignant Disease.*—Until the investigations of Cuneo upon the lymphatic distribution in the stomach and the studies of Borrmann and Cuneo regarding the pathogenesis of cancer of the stomach, the epoch-making clinical researches of recent operators could not have been made. It is clear that carcinoma is a local disease and that there exists a time in its life-history when it could be effectually and safely removed. Early and wide removal has given satisfactory results in those organs accessible to early diagnosis. Much of the study of diseases of the stomach and especially cancer is so hampered by tradition and such a large amount of useless verbiage dispensed regarding the value of chemical findings, that valuable time has been lost and the patient gets to the surgeon too late for operation to be of any avail. There is nothing that will enable us to make a positive diagnosis except an exploratory incision, and as simple incision of the abdominal wall and digital and visual exploration of the stomach is so devoid of danger, we are fully justified in doing it in every suspected case. In favorable cases a partial gastrectomy is attended with a low immediate mortality and the prospects for an ultimate cure have been shown to be very promising. Even in advanced cases in which the malignant growth is obstructing the pylorus, a gastroenterostomy adds materially to the comfort of the patient and prolongs life. I have done gastroanastomosis in four cases in which the patients were near starvation and in an extremely weak physical condition. One patient lived six months after the operation with much less suffering. Another died the

next day, owing to his greatly reduced condition. This patient was operated upon under local anesthesia. Two others have received operative treatment within the last two months and are relieved of the distressing vomiting and gaseous distention formerly experienced. Kroenlein and Mikulicz kept an accurate record of their gastroenterostomies for advanced malignant disease and place the average length of life without operation at a little over 12 months in the nonoperated cases, whereas in the cases in which gastroenterostomy was done, the average was 15 months.

*Gastroptosis and Dilation of the Stomach.*

*Food Stagnation.*—Atony of the stomach may exist for a long time without giving rise to symptoms unless pyloric obstruction exists or the circulation is interfered with. It is a clinical fact that the interference with a free return of venous circulation will cause paralysis of the walls of the digestive tract and consequent tympanitis much more promptly than a mechanical obstruction. Therefore so long as the circulation and innervation of the stomach is maintained, individuals may live for years with abnormally dilated and displaced stomachs, but so soon as compensation fails, there appears, suddenly, all the symptoms of stomach dilation. Some cases of acute dilation may be explained in this way. Whether atony of the stomach occurs independently of pyloric obstruction or not, I am certain from my own observation that we may have a dilated splashing stomach without pyloric stenosis. The advisability of operating upon neurotics with dilated, prolapsed or atonic stomachs is advised against by Mayo and in the main I think justly. But before we put a patient down as a neurotic, we should be very sure that there is not some organic disease underlying the neuroses. Abdominal relaxation, visceral ptosis, and neurasthenic conditions may be caused by a hernia, especially in the linea alba, or in the pelvic floor due to the result of trauma during labor. There is always an organic cause underlying the initiation of the neurosis which starts the vicious circle we call neurasthenia, the foundation of which is probably dependent upon a peculiar

constitutional substratum. It has been reliably estimated that in 90 percent of the cases of neurasthenia as we see them today, the condition is due to lesions of the abdominal viscera, most of which are visceroptosis. Although much can be done in the treatment of these patients by rest in bed, medication, and external support, still there will be not a few in whom surgery will have to be resorted to in order to effect a cure.

The following case will serve to illustrate this position.

Mrs. F., aged 43, was suffering from neurasthenia, and nervousness due supposedly to the approaching menopause. She had borne several children and gave a history of spells of painful digestion lasting for several years, she was emaciated to a skeleton. An examination revealed ptoses of all the organs from the pelvic floor to the diaphragm. The uterus was prolapsed, she had cystocele and cystitis, rectocele and inability to empty the bowel readily, she had nephroptosis and Dietl's crises. Her stomach was in a position of extreme ptosis, the greater curvature being three inches below the umbilicus, and greatly distended, giving her much distress, and there was also food stagnation. I began by restoring the pelvic floor, overcoming the bladder prolapse, correcting the retroposed uterus and attempted to relieve the atonia gastrica by external abdominal support and taking the weight of the clothing from around the waist-line. This seemed to help for awhile, so that she got out of her bed-ridden condition and gained several pounds in weight. Her gastric symptoms were still persistent and pronounced after a period of four months, so I determined to do a gastro-enterostomy. The stomach was found much dilated and the pylorus much thickened, admitting the tip of my little finger with difficulty. The relief was decided from the first, and her stomach symptoms rapidly disappeared. In two months she was able to do her housework and come to my office in a street car. It is now about one and a half years since her first operation and she has moved with her family to one of the range towns and has taken sole charge of her household duties.

I am firmly of the opinion that we do our so-called neurasthenic patients a great injustice if we do not investigate closely the condition of the abdominal viscera.

*Hyperchlorhydria.*—In reference to this con-

dition Mayo Robson says: "There is secreted a gastric juice that contains an excess of hydrochloric acid which is associated with very definite symptoms of pain and discomfort directly the stomach has parted with the food from the last meal, a distress that is sometimes known as hunger pain. Such symptoms are generally if not always associated either with ulcer of the stomach or of the duodenum or both. If the symptoms are not relieved by careful dieting and medicinal treatment, surgical means in the shape of a gastroenterostomy should be resorted to." In two of my cases in which ulcer could not be demonstrated but in which hyperchlorhydria existed and the symptoms abated by operation, the explanation might be made upon this basis.

*Gastroanastomosis.*—The first practical application of gastrointestinal anastomosis, was made by Wolfler in 1881, at the instigation of his assistant Nicoladoni. Wolfler had the abdomen open for the purpose of removing a cancer of the stomach, but found the disease too extensive to permit of removal; he thereupon established an anastomosis between the stomach and intestine to allow the food, which had been obstructed at the pylorus to pass into the bowel. Since then many modifications and devices have come into use, and it would be interesting to study these, but the purpose of this paper will not permit. The operation of choice today, when radical removal of malignant disease is not intended, is a posterior gastro-enterostomy, the anastomosis being made between the most dependent portion of the greater curvature of the stomach and the jejunum, about four or five inches from its junction with the duodenum. This portion of the bowel naturally lies up against the posterior surface of the stomach and seems to give the best results. In order to do this operation, it is necessary completely to eviscerate the stomach and transverse colon and turn it entirely over, bottom side up. This maneuver would be impossible in cases of advanced malignant disease or extensive adhesions, and under such circumstances, an anterior attachment becomes inevitable. The next operation most in favor

with the majority of surgeons for pyloric stenosis, chronic ulcer, gastric dilation with and without atony and perhaps hemorrhage is connected most directly with the pylorus itself. I am of the opinion that these operations will come more into favor than they are now, inasmuch as they conform more nearly to the natural anatomic conditions and physiologic requirements. They are designated as pyloroplasty or, perhaps, to speak anatomically gastroduodenostomy, because the operation is not confined to the pylorus, but most involves the stomach and duodenum. The operation devised by Finney, called pyloroplasty, is to my mind the best of this class of operations. Clinical experience as well as the experiments of Cannon and Blake, of the Harvard Physiological Laboratories, seem to indicate that the rationale of gastrojejunostomy will have to be revised. I consider the contribution of Cannon and Blake most important and timely, coming as it does at a time when treatment of diversified stomach disorders by gastroenterostomy is receiving such a boom. It takes time for us to learn that recovery from an operation does not mean a cure of the patient, nor perhaps even relief from his suffering, to say nothing of his possible detriment as months and years go on. In my own limited observation, I know of a few cases in which an anastomosis had to be taken down and a second operation done a few weeks later, for the alleviation of alarming symptoms and I also know of cases in which the expected relief was not obtained, notwithstanding the fact that the operation was done by a most expert gastroenterostomist. Many brilliant cures have been made, and this operation is not unlike intubation in its immediate benefits when indicated. In fact I have almost universally observed the praise bestowed upon the operation by freshly gastroenterostomized patients. In many this is undoubtedly due to the beneficial effect of the operation, but in some I surmise the rest in bed and judicious feeding have had considerable to do with the cessation of the symptoms.

It is barely possible that in cases of confirmed chronic gastric ulcer, the operations of

gastroenterostomy and pyloroplasty are as Krogus contends, only palliative. He reports<sup>1</sup> six cases in which the patients died from hemorrhage or peritonitis within a short space of time after having undergone one or the other of the operations mentioned. He considers, the existence of a latent or apparently cured gastric ulcer treated by palliative surgery a grave risk, and that the disturbances due to the ulcer persist in many cases, notwithstanding these operations; peptic ulcer of the jejunum or carcinomatous transformation of the ulcerated area, being by no means rare. He recommends a radical excision of the ulcer-bearing area as the only ideal operation. By close observation of the literature, we notice a gradually increasing number of cases being reported of jejunal ulcers following gastroenterostomy. From an anatomic and physiologic standpoint, we would rather expect this to be the case, as in no instance is the acid gastric juice continually poured into the intestine. The presence of free acid in the stomach opens the pylorus, allowing a jet of acid chyme to pass into the duodenum, and in return, the acid in the duodenum closes the pylorus and stimulates the flow of alkaline pancreatic secretion.

*Anatomic and Physiologic Considerations.*—The stomach is the first and the largest dilation of the digestive tube within the abdominal cavity, and the first to have a peritoneal covering. It may be described as a large hollow compound gland, the walls of which contain powerful muscular elements lined with tubules which elaborate special secretions. It constitutes the receptacle for the maceration, comminution, and chymification of the food which it passes intermittently through the pylorus into the intestines, for final digestion and absorption. One of the most essential offices of the stomach is to divide minutely as well as to mix thoroughly the food sequence with its special secretion, the enzyme and the acid, without which the natural digestive process is materially<sup>1</sup> and appreciably impaired.

For our immediate purpose, we may divide the digestive process into mechanical and chem-

<sup>1</sup>Archiv. für klin. Chir., September 4, 1905.

ical, both being essential for the normal processes of digestion. The mechanical process appears more fixed and requires less disturbance to produce symptoms than the chemical, although the great elasticity of the latter may overcome defects of the former. At the stages of digestion, the whole product may be acted upon by micro-organisms and rendered not only unfit for use but actually poisonous.

Immediately, food enters the stomach, the fundus begins to enlarge and this is followed by expansion of the whole cardia. This expansion continues upward to the left toward the diaphragm, displacing the coils of the transverse colon, which lie here when the stomach is empty. The pyloric portion, consisting of the antral and preantral thirds, remains contracted until the active part of digestion begins. According to Cannon, the food is gradually squeezed out of the fundus into the churning process in the antrum, through a tube-like formation of the middle or preantral segment, along which peristaltic contractions pass, about three to the minute. Mortiz says, "Finally, the pylorus opens at irregular intervals allowing the liquid portion to pass into the intestine, while the solid particles are returned to the antrum for further liquefaction. This process is repeated by the contraction of the circular fibers and by the gradual shortening of the longitudinal fibers of the stomach, until it is entirely empty. An important result of the shortening of the stomach as it empties, is the change of position of the most dependent part. The greater curvature of the stomach in the cadaver or in a living person relaxed in anesthesia commonly reaches a point considerably lower than the pylorus. But the shape and position of the stomach under such circumstances are not the same in the functioning organ. Observation with the röntgen rays on the normal stomach containing food mixed with bismuth subnitrate, proves that the shortening of the stomach takes place just as if the longitudinal and oblique fibers passing over the surfaces to the greater curvature lifted the organ up to the one fixed point of the contracting fibers—the cardia. Since the pylorus is more or less fixed, it does

not rise with the rest of the stomach. These observations with the röntgen ray confirm those made by Jonnesco and Bettman, that the pylorus during the last stages of digestion, is the most dependent portion of the stomach and that the greater curvature forms an angle of about  $45^{\circ}$  with the horizontal and sagittal planes, while the anterior or lesser curvature is still more oblique. The consequence is, that in the last stages of digestion when the gastric contents are more fluid than in the earlier processes, the pylorus becomes the lowest point in the stomach and the contents, therefore, do not have to be moved upward in order to pass into the intestines. Weisker and Kelling contend that the intraabdominal pressure, both inside as well as surrounding the stomach and intestines, is practically the same, *i.e.*, atmospheric. That the pressure in any part of the passive alimentary canal depends upon the weight of the overlying organs. If the canal is inactive the food, therefore, is as if surrounded by water. Gravity does not act and gravity drainage does not occur."

Food is pushed from the stomach as it is pushed elsewhere in the alimentary canal by peristalsis due to contraction of the muscles in the walls of the canal. Pressure is greater near the pylorus than anywhere else in the stomach, and the food leaves through the pylorus, even the partially obstructed pylorus, rather than through an open stoma some distance away. (Cannon and Blake.)

To the thinking surgeon these facts must naturally give rise to the question as to how the operation of gastroenterostomy so favorably exploited for the cure of gastric ulcer and hemorrhage effects a cure. Perhaps many of the beneficial effects of this operation result from rest in bed and careful feeding and lessened irritation to the ulcer-bearing area, with partial or complete healing of the ulcers. But in all of my cases these measures had been tried many times with no lasting benefit, before an operation was resorted to. In view of the information we have, the curative effects of this operation cannot be attributed to drainage of the stomach or to short-circuiting of the food current as is

so often contended, for unless the pylorus is closed, food will continue to pass through it.

The explanation that I have arrived at, is, that the cutting of the muscular fibers in the pyloric end of the stomach does away to a considerable extent with the muscular unrest accompanying gastric digestion, especially when ulceration is present. I believe a gastroenterostomy or a pyloroplasty acts much the same as the cutting of the fibers of the sphincter ani in fissure of the anus. In this latter condition, the feces continue to pass over the ulcer, but the paralyzed sphincter by preventing friction favors rapid healing.

## ACUTE OTITIC CEREBRAL ABSCESS, WITH NOTES ON TECHNIC AND DIAGNOSIS.\*

BY

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John D., aged 33, a millworker, was sent to me by Dr. W. Frederick, who had diagnosed mastoid empyema with a suspicion of brain complication. Two weeks before, there had been a blow on the head while intoxicated. When sober, the next day, there was an ordinary acute rhinitis and pus was discharging from the left ear. About a week later somnolence was first noticed. The patient could be roused and talked clearly, but soon lost interest and dozed off to sleep again. He denied all pain.

On the nineteenth day of the disease, with the assistance of Dr. Ellen J. Patterson and Dr. L. S. Walton, I opened the mastoid. The bone was not much broken down, there were three or four pus pockets of small size in scattered locations. The inner table over the sinus being normal, was not removed. The tegmina were both roughened but no perforation large enough or straight enough to admit a fine probe could be located.

After operation the patient's condition was unimproved. In the next few days, his mentality grew worse and his somnolence increased. Ocular examination by Dr. Glendon E. Curry was negative. Dr. John W. Boyce examined the patient and reported as follows.

"Patient lies in a somnolent condition; may be sufficiently aroused to understand questions, but there is evident obscurity of intellect.

\*Read before the American Laryngological, Rhinological, and Otological Society—Eastern Section, Syracuse, N. Y., February 10, 1906.

Great difficulty in holding his attention; sometimes commences a sentence correctly and intelligently, but wanders off into meaninglessness before finished. In some instances performed an act as requested while his attention was held, but continued to do it automatically, or in response to a request for some other act, when attention had wandered. Strong and unpleasant odor noticed as the bed is approached. Pulse about 72, changing in rate momentarily as patient moves or as his attention is attracted. Size moderate for a man of his weight and development; tension somewhat increased, but not markedly so (172 mm.)—not a marked and typical pulse of intracranial pressure, but tending that way. Heart and lungs normal. Protrudes tongue in the middle line. Patellar reflex more readily elicited on right side than left. Apparently more tone in left leg than in right. Cremasteric reflex present on left side, not elicited on right; impossible to test strength of grip. During about 15 minutes, patient wiped off his mouth, tried to button his night-dress, and drew up bedclothes with left hand; nothing but apparent aimless motion with the right hand, which for the most part lies still, and slightly contracted. Urine retained, rendering catheterization necessary; bowels move involuntarily. While the paresis of the right side is not as certain as I could wish, even without it, the symptoms seem to me sufficient to justify a diagnosis of intracranial mischief, probably abscess of the temporosphenoidal lobe."

Acting on this advice (twenty-third day of disease) I enlarged the mastoid wound upward, and, elevating the dura from the petrous bone, it was found tightly adherent over the tympanic roof. This adhesion was not disturbed. The bone opening in the squama was carried upward for about 3 cm. On reflecting a dural flap, a whitish spot was seen on the median temporal gyrus. Inserting a scalpel through this white spot about 15 mm., no pus followed. Inserting the brain explorer to the same depth in the path of the scalpel, and separating the blades, creamy yellow-greenish pus of "laudable" odor flowed freely, probably an ounce and a half in all.

Dr. Boyce took sphygmomanometric readings during this operation. The chart is shown in the cut, and his remarks are given farther on.

The "cavity" was packed with gauze, which was easily and gently placed while the tract was dilated with the brain explorer.

Bacteriologic report by Dr. Joseph H. Barach: "Streptococci in pure culture."



wounds may differ greatly. True, extending the bony wound upward from the mastoid wound enabled the finding of the adherent dura over the tegmen tympani, but had this not been found I would have explored the brain in the same way. The only disadvantage of the separate wound method is in drainage of extradural abscesses in the middle fossa; but if this condition is suspected, it is easy to enlarge the bony wound downward. The time element is not a factor, as with my ratchet trephine a three-fourth inch button of bone can be removed in five minutes, and three minutes more with the rongeur will usually make a sufficiently large opening, two inches in diameter if so desired.

In a case in which no pus is found, it is an inestimable advantage to have a separate field and primary union. Opening the brain on a day subsequent to that of the mastoid operation assures asepsis, and in weak cases the shock from loss of blood is less. But little blood is lost in the brain operation.

The insertion of a scalpel in this case was an unusual procedure with me, as I never use any thing but the dilating forceps which I devised a number of years ago for this purpose.

The presence of the white spot in the cerebral cortex is my excuse for varying from what I have always advocated, namely, exploring the brain posterior to the located site of the abscess, in order to get the aid of gravity in drainage in the dorsally decumbent patient.

This is contrary to the teachings of the best authorities, who advocate drainage through the minimum amount of brain tissue, but it seems to me that efficiency is the criterion; and with a cigaret drain the posterior drainage has yielded me the best results. With this cigaret drain, a little longer or shorter tract makes no difference.

The use of the little finger for exploring purposes, I am convinced is a mistake. While no harm came of it in this case, I am certain that there is considerable risk of the bulk of the finger increasing intracranial pressure and a still greater risk of disturbing the protective sealing together of the meninges by which they

obliterate the arachnoid spaces around the meningeal opening. Of course, a very large dural flap and a more dextrous finger than mine, may doubtless make it safe. Dench uses it, and no operator in the world gets better results than he does.

So much for criticism of my own work. Coming now to other points, it would seem that the glancing blow of a chisel such as I use, with rounded basil, conveys no shock to the brain. Few men realize that a chisel must be sharp. With a dull chisel driven in perpendicularly to the surface by hard blows of the mallet, great harm may be done. Frequent light taps only are needed for a sharp chisel, which should be held at the farthest possible from the perpendicular. The rounded corners prevent injury to the dura, nerve, sinus, or canals. The gouge I never use.

The scattered pus pockets in the mastoid indicated to my mind an infection of the mastoid by the bloodvessels of thrombotic, or more likely, embolic origin. The brain lesion, however, evidently originated by pyogenic extension, as shown by the adherent dura, the tract subsequently closing.

The finding at the autopsy of grounds for the assumption that the ventricle had burst outward into the abscess is interesting and unusual. The clinical observations certainly corroborate this view. Favoring factors were the skull and dural openings, the weakening of the ventricular wall through disease, all of which furnished the point of least resistance through which bursting occurred upon a slight increase of intraventricular pressure, due either to occlusion of the foramen of Magendie, serous meningitis, or other cause. The interesting points in this case are: 1. The extreme rapidity of the abscess formation. Cerebral symptoms became manifest one week after the first appearance of the discharge. 2. The coincidence of the blow on the head—possibly a factor only by reason of increased vulnerability. No route of infection, or sign of traumatism was found. This is the fourth case of brain abscess with a history of a blow on the head that has occurred in my practice. 3. The

advisability of overhead turns of the bandage firmly fastened together with adhesive strips, especially in unruly patients. In addition, if constant special nursing is impossible, *camisoles* are necessary in some cases. 4. The sphygmomanometric demonstration of: (a) The harmlessness of the chisel of the kind and in the manner used; (b) the necessity of accurate blood-pressure observations in all brain abscess cases. 5. The value diagnostically of a peculiar fetor of the breath. Not the fetor of faulty metabolism or autointoxication. The laryngologist will be better able than others to distinguish the peculiarity. 6. The bursting of the lateral ventricle into the abscess "cavity."

In appending the following notes by Dr. John W. Boyce I would state that the aid of a nonsurgical medical attendant is of paramount importance. This is conspicuously true of auscultatory percussion. It is only of value when done by one whose ears are trained in physical examination of the chest. We, otologists spend much time training our fingers and our eyes, and occasionally our noses, but rarely do we train our ears. I am unwilling to trust my hearing, though I will and do trust my eyes and fingers to any extent. In chronic suppurative ear disease, I feel confidence in my sense of smell to differentiate between osseous necrosis and saprophytic processes. If auscultatory percussion is attempted by otologists it will never be accorded the place it deserves in the diagnosis of brain abscess.

#### NOTES ON DIAGNOSIS BY DR. JOHN W. BOYCE.

*Auscultatory Percussion of the Cranium.*—To practise this, the patient should lie high on the operating table, the head being supported by a small hard pillow under the muscles of the neck so that vibration may not be "stopped." The stethoscope should be applied to the forehead, or to a bald or shaven spot in the middle line. Percussion of moderate force is to be made alternately at corresponding points on the two sides of the head. In certain cases a surprisingly marked and definite area of dulness will be found on the affected side.

When heard, it will powerfully influence the mind in favor of the diagnosis. It is impossible as yet to say in what proportion of cases this occurs—how much weight should be attributed to its absence—or how useful it may prove, on further experience, for localization. All that can be said is, that in certain cases it is of positive value, and that it deserves more general consideration than it has received.

*Unilateral Paresis.*—In two of Dr. Chevalier Jackson's cases of abscess not located in the motor area, I have observed that the capacity for any but the simplest movements was much diminished on the opposite side of the body. Owing to the delirium or stupor often present, this symptom is not so obvious as would be anticipated. We are particularly apt to be misled by the fact that, if the dynamometer be firmly placed in the affected hand, the patient can exert the ordinary degree of pressure on it. The paresis extends to the muscles of the face, but may not be apparent because of apathy. If we can excite motion in the face, we are apt to be misled by the fact that emotional expression is quite frequently asymmetric in normal subjects. Even the Venus of Milo had a crooked face. To elicit this symptom, the best plan is to seat an unskilled and unprejudiced observer at the bedside with a sheet of paper ruled for the right and left sides, and instruct him to note, in order, every motion made by the patient for several hours. In one instance, 15 minutes of this sort of observation cleared up a case that had been very obscure.

*Blood-pressure.*—It is only in brain surgery that a sphygmomanometer seems to me an indispensable instrument from the practical point of view. Organic lesion is apt to be attended by general intracerebral pressure, and the blood tension rises in correspondence. No particular importance attaches to the first reading. We never know the normal standard for our case, and there are always some incidental circumstances, the effect of which we cannot exactly gauge, but if observations be frequently repeated, it gives us a most important line on the progress of the case. In two cases of Dr. Jackson's the foregoing case and one reported

in *New York Medical Journal*, June 23, 1906, C. J.] after evacuation of an abscess, blood-pressure fell immediately to what we must assume to be normal in those cases. In the course of a few days, the pressure climbed steadily to the height attained before operation. Almost without aid from other symptoms, it was possible to say that there was pus shut up within the skull, and further exploration verified this opinion in both instances: In one, by opening a tract that was not draining properly; in the other, by disclosing a separate, and probably newly formed abscess cavity.

**Leukocytosis.**—Leukocytosis ordinarily attends abscess. As it occasionally fails, its absence can never be of great negative value. In a recent case in which subsequent operation showed at least half an ounce of rotten pus within the brain, two counts on different days showed only 7,750 and 6,600 white cells per cubic millimeter, respectively. The value of positive leukocytosis is much diminished by the fact that it may be produced, not only by mastoid trouble, but by a suppurating middle ear of itself. Its great value would seem to be in traumatic and idiopathic cases. The question of abscess, however, sometimes arises after the middle ear and mastoid have been cleaned out. In this case, a rising or continuously high count should carry some weight, for it has been shown that after radical operation the count rapidly tends toward normal. Dr. Joseph H. Barach, pathologist to the Eye and Ear Hospital, is now making some observations on this point, which will doubtless be given to the profession when completed. They show that a distinct diminution of the count can be observed within two days, and that in ordinary cases, it probably approximates normal within two weeks. If, therefore, after operation no such fall is noted, the surgeon should bear in mind the possibility of deeper mischief, though it is scarcely necessary to say that more than this would be required to justify opening the skull. The differential count promises to be of greater value, but as yet, records of a sufficiently large number of cases have not been accumulated.

## DIGEST OF LITERATURE.

### REVIEW OF SOME RECENT LITERATURE ON THE BLOOD.

BY  
A. G. ELLIS, M. D.

**Parasites of the Blood.**—*Spirochetas*.—Schaudinn's discovery in 1905 gave a new impetus to the study of spirochetal infections and considerable time has lately been devoted to relapsing fever and its causative organism. Among the most extensive investigations are those based upon two cases of the disease occurring in New York City late in 1905. Carlisle<sup>1</sup> deals with the clinical side, stating that the two cases, one due to accidental inoculation while experimenting upon animals with material derived from the first, are the only ones on record in this country in which *Sp. obermeieri* has been found in the blood. Case I, was not typical clinically and would not have suggested relapsing fever to any one not well acquainted with the disease. *Spirochetas* were found only after prolonged search under the supposition that malarial parasites were present.

Norris, Pappenheimer, and Flournoy<sup>1</sup> detail inoculation experiments with the organism. Repeated attempts to cultivate it upon various media failed. Their studies lead them to conclude that *spirochetas* must not be considered as protozoa. This view is based upon the absence of definite longitudinal division; absence of chromatic particles corresponding to macro- and micronucleus; the occurrence of transverse fission; the production of active immunity, and as shown by Novy the formation of antibodies sufficient to create passive immunity. They believe it more rational to regard these organisms as bacteria or as in a class by themselves. Novy and Knapp<sup>1</sup> contribute an exhaustive study of the *Sp. obermeieri* and related organisms. Working with the spirillum obtained from the same source as that described by Norris, they reach the same conclusions as to its bacterial instead of protozoal nature, giving nine reasons therefor. They state that this has been shown true of *Sp. duttoni*, the organism of African tick fever, and also of *Sp. gal-linarum*. They find that, contrary to the statements of earlier observers, *Sp. obermeieri* can be transferred by inoculation to rats and mice as well as to man and monkeys. Attempts at cultivation by these observers also were negative. Until the organism is grown on culture media many points regarding its nature must remain unsettled. Novy's experiments demonstrate the possibility of prevention or cure of

spirillar infection in rats and mice by a sufficiently active immune serum. Its feasibility in man is also suggested but the practicability of this is yet to be shown. Novy regards as proved the view that *Sp. obermeieri* and *Sp. duttoni* are two distinct organisms and hence ordinary relapsing fever and African tick fever are different diseases. The spirillum of the relapsing fever of Bombay appears to differ from both these organisms, increasing the evidence that points to the existence of a group of relapsing fevers.

*Sp. duttoni* has been shown by Breinl and Kinghorn<sup>2</sup> to pass from mother to fetus in the case of rats and guineapigs. The parasites were found in the placental blood in practically the same number as in the maternal heart blood but in scanty numbers in the fetal circulation. The young of infected animals showed no marked immunity to infection.

*Sp. pallida* has many times been demonstrated in the blood of persons suffering from secondary syphilis but conflicting results continue to be announced. Nattan-Larrier and Bergeron<sup>3</sup> attribute this to defective technic. They now take 10 cc. of blood from a vein, place half in each of two flasks containing 100 cc. of sterile distilled water, centrifugalize 15 minutes, and from the sediment make thin spreads which are dried for a few minutes at 37° C. or fixed in alcohol and ether. The films are treated as tissue sections, good results being obtained either with Van Ermengen's silver method or by Heidenhain's with iron alum.

Rocky Mountain spotted fever (tick fever) has been studied recently by several observers. Ricketts<sup>4</sup> reports the results of animal inoculations with defibrinated blood from human patients by which means he believes the disease was transmitted to guineapigs and monkeys. He states that the material upon which his conclusions are based is rather scanty but he regards them entirely trustworthy. They certainly would be more convincing if they were greater in number. Ricketts does not agree with Stiles that the possibility of transmission of the disease by ticks should be abandoned along with the piroplasma theory. He believes that ticks may harbor and transmit pathogenic parasites other than piroplasmas. In a later communication Ricketts<sup>5</sup> records experiments which indicate that spotted fever was transmitted to a guineapig by the bite of an infected wood-tick. Controls bit by uninfected ticks exhibited no symptoms. This work of Ricketts has been confirmed by King<sup>6</sup> who succeeded in transmitting the disease from one guineapig to an-

other by means of ticks, an experiment not performed by Ricketts because of the lack of animals. These results point strongly to the probability that the disease in human beings is transmitted by ticks. It is most desirable that further researches regarding the nature of the infecting organism be undertaken. Mooser<sup>7</sup> describes several cases of the disease occurring under his care in Nevada. All the patients were sheep-herders and each gave the history of recent tick bites. One camp has the special reputation of developing cases of the disease.

More recently Ricketts<sup>8</sup> reports observations adding weight to his former statements. He also states that the parasites are not located essentially in either erythrocytes or leukocytes but are present in the body fluids generally.

A new blood filaria of man is described by Ashbourn and Craig<sup>8</sup> under the name of *Filaria philippinensis*. A minute description of the parasite, which was found in the blood of a Visayan prisoner in Manila is given. Filariasis is rare in those islands, which is believed would not be the case were the parasite one of the common varieties.

**Opsonins.**—Literature concerning opsonins and the opsonic index as a means of diagnosis and treatment is rapidly increasing. Opsonins are substances in the blood plasma or serum which combine with microorganisms and thus render them susceptible to the action of phagocytes. The phagocytic power of leukocytes in the presence of serum from an infected person, compared with that of leukocytes in the presence of serum from a normal individual, furnishes the opsonic index of the former for the particular organism with which he is infected. Two general statements regarding the opsonic index appear to be well founded. 1. In localized infections the index for the causative organism is below normal. 2. In systemic infections the index fluctuates, often from above to below the normal.

Kinghorn and Twichell<sup>9</sup> give at length the technic of the tuberculo-opsonic index. I know of no paper of similar length which furnishes so much detailed information. The writers call particular attention to the number of leukocytes that should be counted in making a test. Some observers consider 20 or 30 enough to furnish a sufficiently reliable index but Kinghorn and Twichell find that an accurate count requires from 100 to 200 cells. Their point is well supported by tables showing the variations in groups of 25, 50, 100 and 200 leukocytes. A lengthy review of the work upon the opsonic index in tuberculosis is given by Potter, Dit-

man and Bradley.<sup>10</sup> They cite a number of personal tests but state no definite conclusions. McFarland and L'Engle<sup>11</sup> have made observations upon the phagocytic power of the blood of supposedly normal human beings. They find there is no uniformity in the phagocytic indices of the bloods of such individuals. They regard Leishman's method as modified by Wright and Douglas and by themselves as a very simple method adapted to clinical application. This is rather opposed to the general idea that the technic is complex, difficult to master, and only to be carried out by experienced laboratory workers.

Are opsonins distinct from other antibodies? is asked by Hektoen<sup>12</sup> who, after detailing experiments upon the red cells of goats and sheep with rabbit serum, answers the question in the affirmative. His reason for concluding that the opsonic function of normal and immune serums is due to a distinct body are: 1. Normal serum may possess lytic but not opsonic power, and *vice versa*. 2. Immunization in some cases may give rise to opsonic substances but not to lytic amboceptors or agglutinins. 3. The specific amboceptor has been separated from specific opsonic substances in an immune serum.

Regarding the opsonic index in the diagnosis of tuberculosis, Dodds<sup>13</sup> cites its use in five cases in connection with TO and attests its value. He concludes that temperature reaction in tuberculin injections is not always to be relied upon. A normal opsonic index points to a negative diagnosis but is not to be taken as always conclusive. Clemens<sup>14</sup> is emphatic in his claims concerning the great advantages of the opsonic index in the diagnosis of tuberculosis, asserting that, 1, it is a harmless procedure, the diagnosis being made outside the patient's body; 2, it is practically infallible; 3, it permits of the use of tuberculin to the patient's best advantage—curative; 4, it removes the dangers of diagnosis by tuberculin. A very important point in connection with the findings of certain observers that there is a lower opsonic index in tuberculous patients after walking, is brought forward by Ellett.<sup>15</sup> He determined the opsonic index of men training for a boat race, both before and after rowing. In one the blood was examined 11 times before and nine times after, the indices before averaging 1.32 and after 1.17, the tubercle bacillus being used as an indicator. Another man was examined five times before and five times after rowing, the averages being 1.08 and 0.78. These results show that severe exercise lowers the index even in healthy persons.

Bergey<sup>16</sup> carried out experiments to deter-

mine if the macrophages of Metchnikoff as well as the polynuclear leukocytes are phagocytic. He found that in a fairly constant degree the macrophages took up a greater number of bacteria than did the microphages. By tests with *B. dysenteriae* and other organisms he obtained results indicating that the opsonic power of blood-serum is much more pronounced for those bacteria which induce septicemia than for those which induce a more distinct bacterial immunity. Reque<sup>17</sup> finds that *B. diphtheriae* is very susceptible to phagocytosis and that there appears to be an increased formation of opsonins during convalescence from diphtheria. This needs further investigation. A conclusive determination that the opsonins increase in such a disease as diphtheria in which the infectious organisms multiply only locally and the toxins invade the general system, would tend to show that some substance is split off from the bacteria, and entering the circulation stimulates the formation of opsonins.

The treatment of infections by vaccines with the opsonic index as a guide is the more practical part of the recent work on this subject. The principle of this treatment is well summarized by Ross<sup>18</sup> as consisting in increasing the antibacterial substances of the blood by inoculating the patient with dead microorganisms of the same species that has caused and is maintaining the morbid process. He has obtained good results in one case of tuberculous cystitis and one of tuberculous glands of the neck, using TR controlled by the opsonic index. He does not hope for much from this treatment in advanced cases of pulmonary tuberculosis but in early cases it is a most valuable weapon. Great care and persistence are required in the use of this treatment as it is a matter of at least many months, however early the case may be. Ross believes that the tuberculo-opsonic index will eventually prove of material value in the differential diagnosis of lesions simulating tuberculosis. Grace-Calvert<sup>19</sup> furnishes a valuable discussion on the opsonic index and sanatorium treatment of tuberculosis. The requirements are the regulation of the time of dosage to avoid prolonged negative phases, the frequent determination of the opsonic index, and appropriate doses of TR. He believes this method is a most valuable adjunct not only to sanatorium treatment but also to the existing therapy of many other diseases.

Hektoen<sup>20</sup> considers numerous phases of phagocytosis and opsonins and says that remarkable results have been attained by the vaccine treatment in intractable cases of bone,

lymph node, and subcutaneous tuberculosis and the application to pulmonary tuberculosis promises well. The study of opsonins has also given a clearer conception of the relative importance of local and general leukocytosis. The use in the treatment of so-called septic infections of agents that increase the general leukocytosis may be of benefit if produced at times when the opsonic index is high. The efforts of Mikulicz and others to increase local resistance before operations would also seem rational. Hektoen says the suggestion lies near at hand that the chances of the patient would be still further raised if operation could be performed during the positive phase following inoculation with vaccines.

*Alkalinity of the Blood.*—Gamble<sup>21</sup> has made numerous determinations of the alkalinity of the blood in normal and in diseased persons. He concludes that it is not necessary to titrate with organic acids as dilute inorganic acids do not precipitate albumin in amount sufficient to influence results. Lachmoid in the form of a test paper is the most delicate indicator. Gamble prepares it from filter paper and a one-third saturated alcoholic solution of lachmoid. He finds that the alkalinity of the blood in healthy adults is about 300 mg. NaOH per 100 cc. Its variations in health are slight and in disease it is diminished, apparently in proportion to the accompanying anemia. Gamble regards Dare's method of estimating the alkalinity as of no value.

*Coagulation Time of Blood.*—Taylor<sup>22</sup> reports three cases of hemorrhagic diathesis, if not actual hemophilia, in which administration of dry thyroid extract, three grains three times daily, reduced the coagulation time to half or less and thus permitted operations safely to be done.

*Blood Changes Produced by Heat and Cold.*—Ciuffini<sup>23</sup> has studied the blood changes induced by hot and by cold baths both in healthy and in neurotic persons. He finds that the variations in red and white cells apparently produced by these measures are inconstant and for the most part depend upon peripheral disturbances of the circulation rather than upon any special action exerted by the bathing upon the blood-forming organs. These findings indicate that the effect upon the blood to be sought by the employment of these measures is one of distribution instead of formation.

*The Blood in Mumps.*—Wile,<sup>24</sup> in studying the blood in 20 cases of this disease, found a relative and absolute lymphocytosis (averaging 59 percent). This begins on the first day and continues until all swelling disappears. The change is more marked in bilateral cases and is

a diagnostic feature of mumps in differentiating it from adenitis.

*The Blood in Scurvy.*—Senator<sup>25</sup> records marked diminution in the red cells until they were only one-sixth the normal; the hemoglobin fell to a greater degree. There was a steadily advancing leukocytosis with diminution in the lymphocytes. In short, the blood changes corresponded to the course of a severe, simple, posthemorrhagic anemia. Postmortem confirmed the presence of extensive hemorrhages and advanced anemia.

*Blood Staining.*—New blood stains, mainly modifications of the methylene-blue-eosin mixtures, are continually being suggested. Whitman<sup>26</sup> uses as a solvent for Wright's stain a mixture of one part glycerin and nine parts absolute (ethyl) alcohol. This is not an ideal fixative but if the films are fixed with methyl alcohol and this followed by the stain diluted at once with water no time is lost. About eight drops of water to five drops of stain should be used. This solution is said to be quite permanent. Huisman<sup>27</sup> uses equal parts of a 1.175 percent solution of solid azur blue in pure methyl alcohol and an 0.825 percent solution of eosin BA (Höchst) in the same medium. This stains in two minutes without previous fixation. McNeal<sup>28</sup> contributes an historic and critical review of the methylene-blue-eosin stains and gives the formulas of several which he has found useful. None of these stains yet devised has proved entirely satisfactory, hence the large number of formulas offered. Chemical studies as those of McNeal are valuable in elucidating the nature of the products resulting from the mixtures and should result in the discovery of a more equable and permanent combination.

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## RECENT EDITORIAL OPINIONS.

**Journal of the American Medical Association.**—IS APPENDICITIS ON THE INCREASE? It is evident that while appendicitis as such is of recent recognition, its effects have figured in the mortality returns for years. This with the distinct relation between peritonitis and appendicitis make it certain that probably to a large extent the increase in the incidence of appendicitis is only apparent. It is now recognized at an early stage where 15 years ago it was hardly recognized at all. Yet we are forced to believe that deaths attributed to peritonitis are still largely due to appendicitis. There is still room for improvement in its early diagnosis.—**INTERNATIONAL SANITATION:** The Third International Conference of American States suggested the adoption of measures tending to secure improved sanitation of cities. An international agreement to this effect would be of the greatest importance to commerce and the public health and would ultimately relieve in a great measure, the necessity of quarantine. A working plan should recognize that epidemics requiring national intervention take origin in insanitary local conditions. The argument naturally follows that national governments must in some manner take a more direct part in correcting these faulty local conditions.—**BUSINESS BEFORE HEALTH:** The milk dealers of Rochester, N. Y., are endeavoring to break down the practically model

milk service secured by ten years' work of health officers. The attorney for the producers is reported to have said it was not right to raise the price of milk for 200,000 people because of 7,500 babies. It would be specially unfortunate if the city should take a retrograde step in this manner.—**THE VENEREAL PERIL:** This question is being more publicly discussed than formerly and in the reforms so indicated the medical profession must necessarily be the leading factor. The spread of venereal disease is largely through ignorance, hence the question is one of education. In this work it is the duty of physicians to take the lead.—**THE TYPHOID SPINE:** Fifty cases were collected by a writer last year, but this surely does not accurately represent the frequency of the condition. The nature of the process has been much discussed, the two principal views being that it is due to organic changes and that it is a neurosis. Of late years there is a tendency to regard the former as more probable and this idea is favored by McCrae's recent reports. When recognized the condition should be regarded as organic unless the evidence of its neurotic nature be overwhelming.—**OSTEOPATHY IN CONGRESS:** The bill passed by the Senate for the regulation of osteopathy in the District of Columbia is in several particulars remarkable. The fact that they are to be licensed in surgery, obstetrics, etc., forfeits the claims of the osteopaths that osteopathy *per se* is a sufficient remedy for the treatment of all ills. This is not associated with forfeiture of their demands for special privileges as they have asked and obtained freedom from examination in fundamental branches under conditions imposed on all other applicants. The most pernicious feature is the effort to maintain and perpetuate the spirit of sectarianism in the profession.—**THE MOVING PHYSICIAN:** One is struck by the large number of physicians who, having passed the "starvation period" of practice are unwilling to remain where they are but seek what they believe to be fields with larger opportunities. Such changes operate not only to the detriment of the physician but the community also suffers. The time will come when physicians will feel toward the communities in which they live the same responsibility they now admit toward their individual patient. This tendency to moving, certainly more noticeable than in the days gone by, is to be greatly deplored.—**GUARANTEE UNDER THE PURE FOOD ACT:** The guarantee of the manufacturer under the pure food law means in no wise that the products in the container are in strict compliance with the law. It

means only that the retailer is relieved of responsibility when he sells such goods, that being assumed by the producer. Physicians should be cognizant of this fact as they will often be consulted regarding the workings of the new law.

**Boston Medical and Surgical Journal.**—

**A CRISIS IN MEDICAL INSTRUCTION IN PARIS:** There recently occurred an uprising of the students against the authorities in the medical department of the University of Paris, the Minister of Public Instruction finding it necessary to suspend medical lectures for a week to adjust the difficulties. Other students show a tendency to join and hence there has arisen a condition common enough in Russia but unusual in Paris. Such friction is rarely apparent in the large universities in this country but it is a possibility where peace and harmony ordinarily prevail.—**CLEMENCEAU:** In the present strained relations between church and State in France it is of interest to note that the real leader of the government has been a physician. Invited by Napoleon to leave the country in 1868, George Clemenceau came to New York and established a practice. Later he returned to France and has since been a masterful, and in general a wholesome, force in politics. He is a striking example of what is by no means uncommon in France—the doctor as an active force in public affairs.—**HOSPITALS CONNECTED WITH MEDICAL SCHOOLS:** Dr. St. John Roosa has recently written an article combating the popular idea that in hospitals connected with medical schools, the students rather than the indigent sick receive first consideration. There is no well-founded reason why the union between hospitals and medical schools should not be closer as time progresses. The benefit to the community and to the government by this association is universally recognized by the medical profession. As the lay public becomes more familiar with medical matters, it is to be hoped the true conditions between hospitals and medical schools will be mastered.—**STREET CARS AS BREEDERS OF DISEASE:** In the name of hygiene and preventive medicine “we do protest most earnestly against the conditions which have lately prevailed in the street car service of Boston. It is not a question of why or wherefore the entrance of fresh air has been excluded; it is simply an affirmation that an unwholesome, abhorrent, uncivilized and intolerable state of things has obtained, which lasted long enough to serve as an example of how not to do it.”—**PUBLIC LECTURES ON MEDICAL SUBJECTS:** There has developed within the past few years a definite tendency to bring directly

before the people certain matters bearing upon the public health. The faculty of the Harvard Medical School has designed a plan to instruct the public in an authoritative way. Lectures free to the public will be given Saturday evenings and Sunday afternoons from January 12 to May 12, at the medical school. The advantages are manifest but the utmost care must be taken to prevent misconceptions by the audience. One can foresee in this plan an enterprise of far-reaching and beneficent import.

**Medical Record.**—**THE OPEN-AIR TREATMENT IN HOSPITALS:** In cities the house roof naturally suggests itself as the most desirable substitute for climatic change. Some of the larger hospitals are doing this, recent ones being constructed specially for this purpose. In the ordinary house the roof could be employed for this purpose with very little trouble. It could also be used for playground and general retreat; in this respect the custom of the orientals might well be adopted.—**THE QUESTION OF PURE MILK:** The problem of pure milk supply is worthy of the study of our great sanitarians. It is not neglected by physicians but it does not receive the attention it should from the community at large. Federal inspection, as has been suggested, seems hardly possible. State supervision would be possible but even this would be difficult.—**THE EFFECT OF SALICYLIC ACID PRESERVATIVES ON HEALTH:** The practical conclusion from Dr. Wiley's experiments are that salicylic acid compounds are sufficiently injurious when taken continuously to exert a depressing and harmful influence upon digestion. As food can be preserved in an unobjectionable manner without their aid, there seems no valid reason why they should be retained. Their exclusion follows as a logical sequence and hygienic necessity.—**THE TRYPSIN TREATMENT OF CANCER:** The reports on this subject are interesting if not conclusive. Cases apparently cured are too few to warrant definite opinion. The theory is entitled to respectful consideration but time alone will prove it. In England the results have been uniformly unfavorable. In this country further trials are fully justified by the apparent success already obtained.—**SCHOOL BATHING:** The establishment of public baths in New York is a matter of slow progress. The working classes of Germany and France certainly keep themselves cleaner than do those in England and America. On the continent they are making efforts to supply the schools with baths and thus develop in young children a knowledge of the pleasures of cleanliness. As crowding increases, cleanli-

ness becomes more and more a necessity. Men cannot be made good by mere legislation but we can make it easier for them to be clean.—**TREATMENT OF THE INEBRIATE IN GREAT BRITAIN:** Formerly human interest was almost entirely lacking in the methods of treatment of these persons, but recently a great change has come in the way they are regarded. It is stated in a recent report that alcoholism is the result, as well as the cause, of disease. The *Record* has before expressed the view that it is not wise to press the argument to an extreme on either side. Severe treatment is not calculated to cure inebriates but to treat them too well would be to put a premium on drunkenness. The most rational mode seems to be to place them under the care of a physician who is versed in psychology who would decide what treatment to adopt in each case. The belief that inebriety is in all instances a vice which must be suppressed with a strong hand has been demonstrated to be wrong and beside it is not workable.—**NASAL HEADACHE:** Eyestrain is without doubt the most frequent cause of periodic headache but is by no means the sole cause. When its correction fails to relieve the symptom, some other source of the reflex must be sought. In such cases it must be remembered that the nose may be the offending member. This will of course suggest local treatment instead of internal medication.—**MUNICIPAL CARE OF THE TUBERCULOUS:** In the work against tuberculosis in New York it was early recognized that a municipal clinic or dispensary would be of great assistance. The first report of this clinic, established in 1904, shows the attainment of most satisfactory results. Fifty percent more patients were seen during the second than during the first year. This shows conclusively the value of such a clinic in bringing to light new cases. It is only a public clinic that can hope to bring tuberculous patients under direct control; it forms a type of paternalism in government which should be encouraged instead of combated as it is in some quarters.

**New York Medical Journal.**—**THE REGENERATION OF NERVES:** Mott, Halliburton and Edmunds present observations appearing definitely to indicate the central origin of new fibers in the union of divided nerves. The neurilemmal cells multiply, elongate and unite to form long chains. This process is thought to be phagocytic and nutritive and is effective in providing nourishment for the actively lengthening axis cylinders at the central end.—**RED RUBBER AND THE VERMIFORM APPENDIX:** Mr. Pond, of Liverpool, believes that the increase in appen-

dititis is due to the frequency with which rings of red rubber are used in sealing jars and bottles of articles intended to be taken into the stomach. The weight of probability is against this idea though there is much of interest in his contention. Many suppositions at first appearing to have no better support have finally been seriously considered and even accepted.—**THE FEDERAL FOOD AND DRUGS ACT:** This act is open to criticism in many points but also has many commendable features. One of the best is the provision for a commission to draft rules for the enforcement of the law. The essential features are that manufacturers and dealers are held responsible for the truth of statements made on the labels of their goods. The law will prove a powerful factor for good in improving the quality of drugs, in suppressing quacks, and in checking the spread of the narcotic drug habit.—**THE ETIOLOGY OF BERIBERI:** We can probably exclude the bacillus of Hamilton Wright and the Okata-Kokubo coccus as etiologic factors in this condition. The statements of Tsuzuki regarding the etiologic characters of the coccus isolated by him still lack confirmation.—**TWO DOCTORS' LITERARY DIVERSIONS:** The ventures of our professional brethren in general literature are to be looked upon with gratification. Two noteworthy novels have lately been produced by physicians. One of them is by Dr. Carl Beck, of New York, published in German under the title of *Der Schwedenkonrad*. The other is by Dr. F. E. Daniel of Texas and is entitled *The Strange Case of Dr. Bruno*.—**THE NAVAL MEDICAL CORPS:** Great difficulty is still met in keeping the medical officers of the navy up to the insufficient number authorized by Congress. Slowness of promotion seems to be one of the main considerations that deter young physicians from entering the navy. For more than 20 years there has been no increase in the number of high grade officers. This should be remedied.—**RECOGNITION OF THE SERVICES OF DR. JAMES CARROLL:** There is now under consideration a bill for placing Dr. Carroll on the retired list of the army with the rank of major, but there is some objection to this method of rewarding him. The medical department needs his services and the bill could not be passed except upon special recommendation of the President and without a single dissenting vote in Congress. Some substantial reward is due Dr. Carroll and it is to be hoped a practical method will be found; if a bill in Congress, one that will be immediately passed without objections which would render the measure distasteful.

## NEWS AND NOTES.

**Cold Cars.**—Health Commissioner Whalen, of Chicago, has forced the street car officials to comply with the city ordinance requiring that street cars be heated to a certain temperature.

**An Epidemic of Erysipelas is Feared in New York.**—Not in years has there been such an extensive outbreak of the disease. Twenty-five cases have been admitted to the Bellevue within the last ten days. All the erysipelas cases are placed in isolated wards. The present outbreak is believed to be due to the long spell of damp, cold weather. For two winters cerebrospinal meningitis raged, and this, the third winter, is being characterized by erysipelas and measles.

**The Army Canteen.**—A movement intended to aid in the restoration of the army canteen has been started in Washington, D. C., by women who have formed a society to be known as the Army Canteen Club, and have taken steps to form similar clubs in Chicago, Cincinnati, and several places in New York State. They hold that the restoration of the army canteen will be in the interest of genuine practical temperance, and against what they designate as "the mistaken theory of temperance."

**Influenza in Baltimore.**—According to the estimates of the Baltimore Health Department over 100,000 persons have been affected by the prevalent epidemic of grip in that city.

**Scarlet Fever in Boston.**—A mild epidemic of scarlet fever is prevalent in Boston and its environs, and in one day recently 50 new cases of the disease were reported to the Board of Health.

**Leprosy in Russia.**—The Russian Government is making active efforts to resist the spread of leprosy in the Baltic provinces, where the disease is very common. As one means of repressing the disease a society for the cure of leprosy has been formed at Dorpat, and sanatoriums have been built. Doctors have been sent out to travel through the country to search out persons suffering from the disease, but they have met with great difficulties, as the people refuse to submit to examination or to avail themselves of the facilities offered for treatment. The official investigations, however, have shown what immense strides the disease has made. The number of lepers in Esthonia alone is reported as 5,000, distributed in various areas.

**Oppose Nurses' Union.**—At the annual meeting of the Northampton County (Pa.) Medical Society a resolution was adopted disapprov-

ing the combining of the professional nurses of the county into a union, which was said to make a trade rather than a profession of the calling. It was declared to be unfair for the nurses to fix \$25 a week as the minimum price for their pay, thus depriving poor people of their service.

**Typhoid Still Spreading in Philadelphia.**—There were 67 new cases of typhoid fever reported in one day last week, making a total of 442 new cases in seven days. With the exception of one day, when 70 cases were reported, the record quoted was the heaviest during the present epidemic of the disease.

**Artificial Leg for a Horse.**—The veterinary profession is much interested in a surgical operation which has been accomplished by Professor Udriski, one of the staff of the veterinary school at Bucharest. Having amputated a horse's leg at the fetlock joint, after several failures he succeeded in fitting a leather boot or artificial leg, that enabled the animal to walk about and take exercise.

**Health Record of the Army.**—Surgeon-General R. M. O'Reilly, in his annual report of the work of the army medical department, compares the health of the different armies of the world. The United States and Great Britain are the only countries whose statistics include that part of the army serving outside the home country. Many have low deathrates because their men are promptly discharged and die out of the service. The highest rate of admission to the sick report is held by the Dutch army, whose rate is 13.21 per 1,000 men, the American second, with 12.95, and the Russian army holding the lowest rate of 3.48. The British army ranks first in the deathrate, with 7.13 deaths per 1,000 men, the American army having the next highest, 6.28. The Prussian army has the lowest rate, 2. In the duration of the sickness the American holds the best record. There was marked improvement in the last year, both in the number of cases of sickness and in the deathrate. America had the best record in the nature of illness, but exceeded all others in cases of alcoholism. Tuberculosis as the cause of death led, with pneumonia second. In comparing the different arms of the service the admission rate was highest in the field artillery and lowest in the hospital corps, while the deathrate was highest in the hospital corps and lowest in the coast artillery. In speaking of the health of the troops in the Philippines the report says that all the rates, except the deathrate for disease, were lower than in 1904.

# American Medicine<sup>67</sup>

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The successful feigning of insanity is so rare that the publication of an alleged case has occasioned much comment of an unpleasant nature. To be sure, experts differ in the interpretation of every case, and cast great discredit upon themselves by divergent testimony, but these are generally honest differences of opinion even if they are warped by partisanship or loyalty to the employing attorneys. It comes as a shock to learn that a desperate New York criminal actually feigned symptoms, was sent to the asylum instead of the hereafter and subsequently confessed his deception. The case is of extreme importance, for its widespread publication must surely weaken the too frequent insanity defense of common murderers, each of whom, if financially able, may secure experts to discover the mental abnormalities which exist in every criminal.

**Murder is never excusable** except in the rare cases in which society is unable to guard us. We have voluntarily surrendered our right to protect ourselves, because we cannot do it as well as the combined organism. In America the laws enacted for the purpose of guarding us seem to be inefficient so that murders are dreadfully common and generally excused. Men are beginning to think they must murder to be safe. Except in self-defense it is immaterial why a murder is committed. The important fact is the self-evident one, that the murderer may do it again; and our own safety demands that he be executed or locked up for life—sane

or insane. Even self-defense is sometimes an unsafe reason, for one might mistakenly think himself about to be attacked, and if murder is fashionable he shoots too soon. In every way it is regarded, it is unsafe to permit our insanity experts such freedom in their efforts to turn murderers loose upon society.

**Murder in self-defense should never be necessary** in civilization. If men were sure of death if they committed murder, or were sure of long imprisonment if they assaulted with deadly intent, murders would be less common, and we would not be so constantly liable to attack. The blot upon American civilization is the frequency of murders and it is high time to remove it. We must be satisfied that in our daily life we shall never be called upon to defend ourselves and that the carrying of weapons is unnecessary. The first step in reform is the stirring up of public sentiment that a murderer is unsafe to be at large unless he was surely protecting himself from murder. The medical profession has joined with the lawyers in creating the present immunity from punishment; let them join together in ending it. Let the safety of society be the main factor in justice—the individual is given too much consideration.

**The golden anniversary of the coal-tar products** has just been celebrated and it is well named, for there have been golden profits for fifty years and the various indus-

tries now employ 120,000 men who yearly produce fifty million dollars worth of chemicals. Much comment has followed the recent visit to this country of the originator of all this prosperity, Sir Wm. H. Perkins, now an old man—as years go—though still an active research worker. He was a mere boy, when in 1856 while working as assistant in Hoffman's laboratory in the Royal College of Chemistry in London, in search of the synthesis of quinin, he stumbled upon aniline purple. Before he was twenty he was the pioneer manufacturer of aniline dyes, and from his discoveries have burst forth a horde of dyes and other substances, some of which are now essentials in the practice of medicine. He is another instance, by-the-way, of the fact that the quick perception of the youthful mind sees things which the elders overlook, so that revolutionary discoveries are often made by mere children.

**The coloring of food by aniline dyes** has received renewed attention from this anniversary. Sir William assured us, in a side remark, apropos of our pure food agitation, that the minute quantity of dyes used to give a fraudulent color to prepared foods is perfectly harmless. The point is the fraud and not the harm to health. People are not so foolish as to desire dyed foods instead of those colored as nature left them. The coloring gives a fictitious value because there is an attempt to resemble the best. The fact of a food being colored should be known to the buyer and it would be perfectly proper for our federal government to insist upon this point in its new regulations.

**Labeling the date of manufacture** is another necessity which must come in time even though it be defeated now. Many things improve with age, but foods do not

as a rule. There may be a deterioration harmful to health, or at least the food is not so nutritious. To sell it as a fresh product is either fraud or inimical to public health. If buyers would only insist upon having the date plainly marked on the label, the manufacturers would be compelled to comply. Even as it is, there is already a great demand for such foods, and it will be a fortune to those who supply the demand. Law might not be needed in the end, if all buyers were equally intelligent, but unfortunately they are not, and must be guarded by laws.

**The pure milk industry also had its golden anniversary** in 1906. Fifty years ago, Gail Borden took out his first patents for condensed milk. He was fifty years old then, and apparently reverses the law of youthful discoveries, yet he had been working at food preservation for a quarter century—meat biscuits and what not for travelers and armies. In collecting his milk, he insisted upon absolute cleanliness at the contributing dairies, and it is not at all strange that the rules he formulated sixty years ago are, in all essentials, what is now demanded in the modern model dairy. The world moves slowly and it will take another half century to reform the rotten dairy farms still remaining in the back districts. His pioneer work has undoubtedly saved the lives of hundreds of thousands, and that is no exaggeration. He deserves a monument in every city of America but unfortunately we erect monuments to those who have done the most killing.

**A crusade against bad milk in 1858** was inaugurated by the famous editor, Frank Leslie, and he promptly succeeded in driving the worst of the scoundrels out of business in New York and Brooklyn. An

interesting account of this early pure food crusade was published in *Leslie's Weekly* for April 26, 1906, and it reminds us quite forcibly of the almost identical crusade in 1906 against the filthy methods of the meat industry. It is not at all unlikely that Leslie's crusade was chiefly responsible in calling attention to Borden's milk, and really laid the foundation for that present enormous business. Forty-eight years have passed and the battle is not yet won, for every little while we hear of an epidemic spread by the milk from some farm in the country to the city consumers. It looks as though the city health authority must be extended beyond the city limits, with power to prosecute offenses. Though cities are now obtaining a milk supply which is far superior to that of ten years ago or even five, the good work must not drag for a single minute. It must be made safe to drink milk in any restaurant or hotel in every city of the land. It is still so unsafe that we are compelled to put babies on condensed milk every time they make a journey—a condition of affairs which is really intolerable.

**The decrease of infantile mortality** is so steady and persistent that it deserves more than a word of comment in connection with the betterment of the milk supplies. The phenomenon is noticed in every city, and so far as one is able to make deductions at all, it seems that the number of babies saved from early death is directly proportional to the support given by public opinion to the efficiency of the milk department of the Board of Health. One city reports that in the last year there was a reduction of 25 percent in the summer mortality of children less than five years old. Such a saving of life in one year is phenomenal, but so is it phenomenal for the health commissioner to receive \$100,000 extra, to circumvent those

who sell poisonous stuff called milk. Nevertheless the milk supply is so vastly improved that we read of the conditions of fifty years ago with a feeling akin to horror—perhaps the people of fifty years hence will say the same of us. That is, there is still plenty of room for improvement.

**Bitter denunciation of our educational system** is now being heard more and more often, because people are gradually learning that we have attempted to upset nature. The professional teachers were self-deluded, and at one time succeeded in convincing every one that education was the cure for all social diseases and would even cause our brains to swell out so that a black man would be white. Their utter failure to do what they promised to do has caused attention to be given to the matter and it is now suspected that we are throwing away untold millions of money to accomplish the impossible—make thoughts appear when there are no brains to do the thinking. Every brain must be trained to do its best, but the uselessness—even viciousness—of much of the education given to the less intelligent is now suspected.

**Practical training** is now being advocated more and more, and a definite proposition has been advanced to turn all our pupils into apprentices to learn how to make their living—tools instead of books, work benches instead of desks, and skilled workmen for teachers instead of women who know nothing except history, geography and modified spelling. Education in general knowledge will go on just as well. It is even proposed to let all the little ones work outside the school for half a day if they have opportunity—the half-timers are always the better learners as we have repeatedly said. We must feed them, too, if the

father cannot, and if we compel him to keep his boys in school instead of helping to feed the family. Our stupid method of compulsory education is killing the poorest by defective nutrition, and also preventing them from learning how to earn their living. We are reaping a rich reward for our defiance of natural law—and we stupidly wonder how we are to cure the hundreds of thousands of defective school children produced by our modern methods of compulsory idleness which replaces the work which poor children have done since the beginning of the world. The plan of feeding the poorest of New York's school children is now being given a tentative trial in a small way—some bread and milk at noon—and the results are being watched with the keenest interest. Is it the beginning of a great socialistic movement by which society is to raise the children of the greatest failures?

**Two hundred thousand school children need medical attention** is the startling headline in a New York daily paper which describes the efforts of the Board of Education to obtain funds for the purpose. It is found that ocular defects alone render 80,000 unable to receive the education for which millions of dollars are actually thrown away. Beside all this there are all sorts of remediable conditions—and starvation. The present plan is merely to make a diagnosis in each case and refer it to the family doctor; but why can he not do something in the first place without waiting to be prodded? We trust that the funds will be forthcoming, and that the inspectors will try to find the causes of such wholesale human degeneration. Is tenement life so bad that child rearing is impossible? Or are only certain types the worst afflicted? There is a chance here for invaluable data, and the inspectors owe a duty to humanity, to col-

lect them. Let there be complete details as to nationality, physical type, complexion and all other matters to enable us to determine what kinds of children are the most damaged. Then there will be a basis for future prevention.

**Yiddish panics** seem to be a result of the terrible conditions of the past life of these poor people, who have learned that occasional massacres are their sure fate. It takes but a rumor, even in America, to start an hysterical outburst. Some of the New York schools in the Jewish quarter were recently besieged by howling mobs of parents, who were convinced that their children were being murdered. It required all the available police to prevent a riot, and the excitement did not subside until schools were dismissed and the children found to be alive. It has been charged that the rumors are deliberately started by some doctors who practise among the tenements and who have been deprived of their 15 or 25 cent fees through the charity work of the Board of Health. This accusation is difficult to believe, as the operations would not have been done otherwise and no fees were lost. Still, an interesting complication is brought to light.

**Public medical work** seems to be a transfer of expenses anyhow. The salaries of the physicians come from the taxpayers instead of the family. It is a big step toward socialism as we have often noted, and whether it is for good or evil, time only will tell. Physicians in private practice are being replaced by salaried ones, in the same manner that the private teacher of a century ago has become a public servant. It has not pauperized us to receive a public education, and our socialists inform us that it will be equally safe for the children to receive public medical care as well as food.

We do seem to be drifting in that direction, and driving out of practice a large number of physicians who have made a poor living among the tenements. What is now a charity may become a right, yet the danger of pauperization is a real one.

**Modern child labor** is no doubt dreadfully bad and is deservedly attracting a great deal of attention. It is said, for instance, that the child survives work in the mills only four years, so deadly is the life of dust and confinement in bad air. Comments are mostly in the direction of prevention of all work, but do not make any suggestions as to how the poor little creatures are to be fed. Indeed there is a general tendency to look upon the phenomenon as something new, instead of one as old as man himself. Edwin Markham (*The Cosmopolitan*) works himself into a fine poetic frenzy in referring to the million and seven hundred thousand child laborers in the United States in 1900; yet if we consider that there were fifteen million children between the ages of eight and fifteen inclusive, and that in former times all such children worked, the conditions are improving wonderfully, even if many of the idlers are hungry. Almost all of the successful men of today talk of their hard work in childhood, though generally it was on the farm. Their fathers could not support them in idleness, any more than the present-day poor man can support his numerous children. The small percentage of child laborers today is the best possible proof that men as a whole are better off than ever before and that conditions of the world grow better—not worse.

**The sanitation of factories** has been suggested as a cure, and no doubt much can be accomplished. The owners are brutally indifferent and must be compelled,

by law, to improve the conditions of mill life so much that the child lives more than four years. Nevertheless, the life is so unnatural that it is not possible to make it normal by sanitation, and the destruction of life must continue. The poor babies are born to work, suffer, and die like the rest of us—only they work out their sentence sooner.

**The sanitary value of a water analysis** was discussed by Professor Leonard P. Kinnicutt, before the chemistry section at the New Orleans meeting of the American Association for the Advancement of Science. The paper has attracted considerable comment on account of the growing importance of exact knowledge of the extent to which we are polluting our water-supplies. Population is becoming so dense that we are already at the point where it is extremely difficult to dispose of excreta without poisoning our neighbors. Present methods almost prohibit any great increase of population, and we must change the system or we will soon have no good water to drink at all; and that means endemic disease and enormous deathrates. In the meantime there is urgent need of careful water analyses to determine what is polluted water.

**Nitrogen and chlorin determinations** are the two main factors, but unfortunately both elements are present in large amounts in certain waters uncontaminated by sewage. The normal for the neighborhood must first be obtained and then sanitary deductions can be made. The general impression left by Kinnicutt's paper is the fact that a proper chemical analysis, in spite of its numerous qualifications, does give accurate information. Nevertheless, the bacteriologic tests, though not as exact or valuable as we once anticipated, are still of extreme value, for they often reveal bacilli characteristic of

pollution even when the nitrogenous substances and chlorids have been so diluted as to appear in less proportion than found in many safe waters of the particular kind examined. A point of considerable value is the fact that artesian waters may be polluted through crevices in the rock and are not necessarily safe. In other words, every kind of natural water in settled communities is under suspicion until proved to be safe by an expert analysis.

**The Vitality of the Typhoid Bacillus in Flowing Waters.**—It is reported that recent experiments conducted by the laboratory of hygiene of the University of Wisconsin indicate that the bacillus lives from 8 to 10 days in ordinary flowing water, but seems to be killed sooner by saprophytic bacteria in polluted streams. The old rule of thumb, that a stream purifies itself in five miles is extremely dangerous. If it flows at the rate of half a mile an hour, and a water-supply is pumped from it 20 miles below the outlet of a sewer, it may be only 48 hours between the act of defecation of a typhoid patient and the act of swallowing the still living discharged bacilli in the town 20 miles away. Of course St. Louis is safe from Chicago's diseases poured into the drainage canal, but it is deplorable that it is now our settled policy that one community can pollute another's water, and the latter have no redress, unless it can prove that the bacteria are surely dead before they reach the lower water intake.

**The germ of hydrophobia**, which was announced in 1904 by Negri, is an organism comparable to that of smallpox as described by Councilman. On account of the difficulty of staining such protozoa, there has been considerable reluctance to accept these appearances as organisms at all. It is now stated by Professor Gary N. Calkins, of Co-

lumbia University (*The Popular Science Monthly*, Nov., 1906) that Dr. Anna W. Williams, of New York, by using the Giemsa stain, has succeeded in demonstrating the nucleus and has definitely proved that these are really organisms allied to the rhizopods. It is stated that they are as distinctive of hydrophobia as the plasmodium is of malaria. They appear in the brain and nervous system and Williams has named them neurorcytes. If it is true that thymol is a specific for trypanosomiasis, it is reasonable to expect the discovery of a similar specific in hydrophobia.

**The importance of the study of protozoa** is well brought out by Calkins in the above paper, and he mentions the well-known facts as to malaria, dysentery, trypanosomiasis, the diseases due to species of piroplasma, and those due to spirochæta—relapsing fever and syphilis. Indeed, of the four groups of protozoa—rhizopods, flagellates, sporozoa, and infusoria—only one, the infusoria, is not yet represented among the disease-producing ones. He suggests that yellow fever is due to a flagellate and that possibly cancer is due to a protozoon, which will eventually be found by a lucky hit in staining. The enormous number of protozoa found in lower animals makes it necessary for the worker to devote his whole time to this specialty if he is to make the happy discovery. The rewards are enormous, for the cure of hydrophobia alone by a specific like thymol would remove a dreadful fear which hangs like a pall upon the whole human race. No other disease has such popular terrors. The cure of yellow fever is also a possibility—indeed, all the scourges of the human race may be conquered in the near future. Perhaps it is a mere detail of staining which prevents the discovery of the causes of measles, scarla-

tina and the other exanthems, all of which are generally believed to be due to protozoa.

**Malaria in the naval force at Panama** is mentioned in the annual report of the Surgeon-General. Though the marines were there only from May to July, they suffered so greatly, that the ship was sent to Boston, where it was found that 215 of the 298 were infected. There seems to have been a serious neglect of sanitation and we trust that investigation will show that the medical officers were not responsible for this remarkable showing. The army is compelled to stay in malarious regions for long periods without relief and must prevent malarial infection. Perhaps the marines were not equipped for such a campaign or were not sufficiently aware of the necessity of obeying sanitary laws. It may be one more instance of the necessity of giving greater authority to sanitarians.

**The present discussion of aphasia** is another illustration of the tendency to go to extremes where the golden mean is much more logical. The progress of cerebral localization has created an opinion that one center may be obliterated and yet the general intelligence be unaffected. It is quite evident, nevertheless, that if a part of the brain is rendered useless, the intelligence is necessarily impaired. It is, therefore, just as well that attention should be directed to the intellectual defects of aphasics. Dr. Pierre Marie, the famous Parisian neurologist, the author of the present revolt, asserts that aphasia is essentially an intellectual disease and the aphasic symptoms are only incidents. He bases his opinion upon many autopsies conducted in the last decade, and although the findings include secondary changes, his opinion has great weight. It raises the interesting question as to whether an aphasic is legally competent to manage

his estate or make a will disposing of it—or indeed if he should not be considered a subject for legal restraint.

**The mentality of orientals** has again come up for discussion on account of the suspicion of racial prejudice against an American soldier in the Philippines. He was on duty as a sentinel, when two armed Malays approached him, as though they were about to attack after the manner of their kind—a sudden bolo rush. The soldier killed both and a court-martial, after careful examination, decided that he had done right, but a civil court sentenced him to twelve years at hard labor, which of course means death in the tropics. On appeal to the supreme court the three American judges voted for acquittal but the three native judges were for conviction. Such conduct by Filipino officials should open our eyes to the fact that it is not safe to trust our lives or property to the judgment of orientals. As the soldier was deprived of his inalienable right to a trial by jury, it is evident that we are on dangerous ground in our legal methods and must go back to a point of safety.

**Malay treachery** has again been shown by the murder of Lieutenant E. C. Bolton, of the army, who paid dearly for his theory that he could trust the Moros, and subdue them by kindness. He never carried arms and was attacked unawares by some natives with whom he was on friendly terms. It was once the rule among our Indians, in the oldentime, before they were restrained, that when they went to war, they killed their best white friends first—perhaps because these victims depended upon the fancied security of friendship and were easily taken by surprise. In the larger towns of the Philippines, life is said to be as safe as at home—probably safer than in

the slums of the cities—but in the country, and particularly the southern islands, it is better to adopt the plan of the old frontiersman and trust no Malay until he is dead. We might do the vast majority of them a great injustice to be constantly on guard, but misplaced confidence is often fatal. Physicians who think of living among them should bear this in mind, and not be influenced by mistaken advice of men like poor Bolton—a martyr to his love of his fellowman.

**More Malay perjury** has been reported from Manila and it still further strengthens the growing opinion that this race also has been given power it is unable to use. An internal revenue officer was attacked in Cavite by six highwaymen who attempted to rob him of government funds in his possession. He shot one and fought off the others who promptly charged him with attempted murder, and a native judge actually confined him for two days until his friends in Manila learned of it and bailed him out. It is evident that no white official is safe. Excitement among the Americans in Manila resembles that in our South in reconstruction days when negroes similarly abused their power. Is it not time for Congress to study the mental ability of the Malay and imit the legal machinery placed in his hands? In no other place on earth is the ower race empowered to imprison the white man. It is safe to travel in India, but at this rate t will soon be unsafe to visit the Philippines. Foreign complications are sure to arise if foreigners are so treated, and the self-government we have given the Filipino must be restricted within the limits he can understand. The Cubans have proved that they did not comprehend the government we gave them, and we are now restricting their power to injure themselves. Should we not do the same with those types among us?

## BOOK REVIEWS.

**Atlas and Textbook of Human Anatomy.**—By DR. JOHANNES SOBOTTA. Edited with additions by J. PLAYFAIR McMURRICH. Volume I. Bones, Ligaments, Joints, and Muscles. With 320 Illustrations, mostly in colors. Philadelphia and London: W. B. Saunders Company. 1906.

In this English edition of Sobotta's wellknown work, the atlas and text has been combined in one book, an obvious advantage. The nomenclature is essentially that of the Basle Committee, for the most part Anglicized. The aim has been to incorporate enough description to make practical use of the illustrations and this object has been well attained. The book is therefore one that can be used in the dissecting room as well as in the library of the practising physician or surgeon. Many of the plates were made by multicolor lithography and are models of the lithographer's art. If any comparison is to be made, the illustrations of muscles are probably to be mentioned first, but the other subjects discussed are also admirably pictured; only praise can be accorded to all. The book leaves but little to be desired in the way of an anatomic atlas.

**Materia Medica and Therapeutics in Abstract.**—By CHARLES A. ORR. Medical Abstract Publishing Company, Pittsburg, 1906.

This vest-pocket book of 137 pages furnishes in convenient form an account of the origin, properties and uses of official drugs. It conforms to the latest edition of the Pharmacopeia and expresses doses in both apothecaries and metric system. It includes a classification of drugs, antidotes for poisons, and a list of symptoms leading one to suspect the principal poisons. It is a very convenient pocket aid for students and a reliable guide for physicians. The book is well written and contains but few typographic errors.

**The Nervous System of Vertebrates.**—By J. B. JOHNSTON, Ph. D. With 180 Illustrations. Philadelphia: P. Blakiston's Son and Company, 1906.

This book which traces the origin and development of the nervous system has been written from the functional point of view. In the 19 chapters covering 360 pages of text, are considered the entire subject from general morphology to cerebral localization. At the end of each chapter are given suggestions for laboratory work and references to the literature bearing on the subjects considered. The index in addition to the usual contents refers also to the illustrations, the latter being in bold face type. The book is very well written, being unusually free from superfluous words, and consequently puts this most difficult subject in a light favorable to its appreciation by students. There is a very lucid discussion o the neuron theory. The illustration

have been well chosen. The book is in every way an admirable presentation of the development and histology, from a functional viewpoint, of the vertebrate nervous system. It should meet with a cordial reception.

**Abdominal Pain: Its Causes and Clinical Significance.**—By A. ERNEST MAYLARD, Glasgow. Second edition, revised. Philadelphia: P. Blakiston's Son & Co., 1906.

Revision has given the author opportunity to substitute other matter for that bearing upon the performance of abdominal operations. This is more in line with the title of the work and is an improvement. Three chapters are devoted to the consideration of postoperative pain. It is a very useful book for both physician and surgeon.

**Prevalent Diseases of the Eye.**—By S. THEOBALD, M.D. Cloth. Pp. 551. Price, \$4.50 net. Philadelphia: W. B. Saunders Company, 1906.

This work is a handsome octavo of 551 pages, excellently illustrated and printed in large, clear type, on fine paper—altogether a practical model of a book emanating from an ophthalmic author. The work is strikingly original, although there is sufficient evidence of a thorough reading of the latest ophthalmic literature. It is refreshing to find a treatise of this nature so dogmatic and free from the ambiguity of a record of a long series of opinions from different authors. The work is written essentially for the general practitioner, and there is proper omission of the details of Ophthalmoscopy, Retinoscopy, Subjective Refraction, etc. There is an especially good section on local ocular medication. As would be expected from Dr. Theobald, lacrimal infection is discussed in a manner *ex cathedra*. There is a proper acknowledgment of the importance of the correction of even small errors of refraction, and this work, the author rightly contends, should be done by careful and competent oculists, who have a proper understanding of and faith in the efficiency of carefully selected and adjusted lenses. The chapters on Purulent Ophthalmia and Anomalies of the Eye-Muscles are worthy of especial mention. The discussion of Cataract is thoroughly up-to-date, but there is no mention of the now well-established spontaneous disappearance of cataract. There is perhaps no treatise upon Diseases of the Eye better adapted to the needs of the medical student and general practitioner than this work of Dr. Theobald, and we give it our unqualified recommendation.

**A Text-book on the Practice of Gynecology.**—By WILLIAM EASTERLY ASHTON. Third Edition, Revised and Enlarged. Philadelphia and London: W. B. Saunders Company. 1906.

This work now contains 1059 pages of text and 1057 figures. The author states that the numerous changes are the result of personal experience with new methods and not merely complications. The metric system has been added. Numerous illustrations were removed and others substituted. All of

the changes are in the way of improvements and the whole book retains the careful attention to details characteristic to the preceding editions.

**Walter Reed and Yellow Fever.**—By HOWARD A. KELLY. New York: McClure, Phillips & Company, 1906.

Under this double title Dr. Kelly graphically portrays the ravages of a disease now subjugated and furnishes an inspiring biography of the man who laid bare enough of its secrets to bring it into the list of preventable diseases. The life of Walter Reed is traced from his birth in Virginia in 1851 to his death in Washington, from appendicitis, November 22, 1902. His early years, his study of medicine, his years of hospital and private practice, his entrance into the army, all evince evidence of a steadfast determination to be of service to his fellow-men. The work of the commission, consisting of Drs. Reed, Carroll, Lazear, and Agramonte, appointed to investigate yellow fever in Cuba in 1900, is reviewed in detail, the death from the disease of Dr. Lazear being the only thing to mar the general rejoicing over the results attained. Dr. Kelly has avoided the glamor which many writers throw over the acts of heroic men and tells the story of "a great and good man" in a most impressive style. The value of the work of Walter Reed is emphasized by the recital of the past and present status of yellow fever. His conclusions were accepted *in toto* in the management of the outbreak in New Orleans in 1905 with the resultant wiping out of the epidemic in a way that excited the admiration of the civilized world. The thanks of the profession are due Dr. Kelly for the straightforward account of the life of a man whose doings may well be a model for every student and graduate in medicine.

**International Clinics.**—Edited by A. O. J. KELLY. Volume II, Sixteenth Series, 1906. Philadelphia and London: J. B. Lippincott Company.

The papers in the latest number of this publication are thus classified: Treatment, 4; Medicine, 8; Pediatrics 1; Neurology, 1; Surgery, 5; Obstetrics and Gynecology, 5; Laryngology, 1. All are of value in their respective departments. Special mention would include Treatment of Chronic Valvular Heart Disease, Acute Nephritis, and Migraine by Delancey Rochester, J. M. French, and G. C. de la Carrière, respectively; Significance of Uric Acid, by W. H. Porter; Tumors of the Mammary Gland, by W. L. Rodman; Treatment of Fractures, by G. G. Ross; and Gonorrhea in Women, by Cuthbert Lockyer.

**The Eclectic Practice of Medicine.**—By ROLLA L. THOMAS, M.S., M.D. Illustrated. Cincinnati: The Scudder Brothers Company, 1906.

This book of 1,014 pages embodies the principles of specific medication which constitute modern eclecticism. Diseases are classified and arranged on the same general plan as the majority of text-

books on practice. As stated by the author, the etiology and pathology must be the same for all works on medicine and hence differ only in their elaboration. Speaking of the book as a whole, some parts of it are well written, but others are not up to date and in many ways appeal to us as lacking the care in preparation which should be given a book representing the tenets of 10 000 physicians. The *Spirocheta pallida* is not discussed in connection with the etiology of syphilis; in the consideration of dysentery, acute and chronic are preferred as varieties instead of "the more modern divisions of catarrhal, amebic, and diphtheric;" paratyphoid fever and hypernephroma of the kidney are not mentioned. These, to be sure, are not vital points but together with statements like the following under the treatment of appendicitis do not tend to create confidence in the teachings of the book: "Where abscess formation takes place, and there is no evidence of its pointing to the abdominal walls or of perforating the intestine, the surgeon should be called." This is limiting the sphere of the surgeon with a vengeance. In general, the etiology, pathology, and diagnosis bear the marks of too great haste, with all that implies, in preparation. If in subsequent editions Dr. Thomas improves those parts of his book, readers who are not eclectics, and we venture to say also some of those who are, will be much more inclined to consider seriously its distinctive feature, namely, specific medication.

**Case Teaching in Medicine.**—By RICHARD C. CABOT. Boston: D. C. Heath & Company, 1906.

In this book are given the histories of 78 patients, with questions and suggestion regarding the diagnosis, prognosis and treatment, together with indications for further examination, the value of the family history, and other points. Alternate pages are left blank for notes. A four-page introduction fully describes the method found best by Dr. Cabot for using the case-history plan of teaching. The method appears very practical and one that can be used with profit by instructors in medicine other than the one by whom it was devised, a test which many schemes will not successfully withstand.

**Elementary Exercises in Physiology.**—By PIERRE A. FISH, D.Sc., D. V. M. Second revised edition. Taylor & Carpenter. Ithaca, N. Y., 1906.

In this edition urine analysis has been omitted and greater space given to exercises in physiology, especially experiments in chemical physiology.

**Around the World via India.**—By NICHOLAS SENN. Chicago: American Medical Association Press, 1905.

Dr. Senn has issued in book form his letters published in the Journal of the A. M. A. Added illustrations bring the number to 70. He states that the collected letters are mainly for the professional friends met during his travels but the book will

prove very interesting and instructive reading for his American friends who did not read the serial letters.

**Eczema.**—By SAMUEL HORTON BROWN. Philadelphia: P. Blakiston's Son & Co., 1906.

Our common knowledge regarding eczema has been concisely arranged by Dr. Brown in a booklet of 105 pages. The list of contents includes varieties, causes, pathology, symptoms, diagnosis, prognosis and treatment. The last, including treatment of the diseases in general and in various regions, forms the larger part of the book and will prove especially convenient to the busy physician, as 146 prescriptions are furnished.

**The Cause and Prevention of Dental Caries.**—By J. SIM WALLACE. London: Baillière, Tindall & Cox, 1906.

This series of collected essays, 8 in number, is presented as a supplement to the author's book on the Cause and Prevention of Decay in Teeth. They were published from time to time largely as answers to adverse criticisms of his views on this subject. He believes time has substantially verified those views.

**Epitome of Pathology.**—By JOHN STENHOUSE, M. D., of the University of Toronto, and JOHN FERGUSON, M. D., Toronto, Canada. 12mo, 285 pages, amply illustrated. Cloth, \$1.00, net. Lea Brothers & Co., Publishers, Philadelphia and New York, 1906. (Lea's Series of Medical Epitomes. Edited by VICTOR C. PEDERSEN, M. D.)

This volume treats of both general and special pathology. The former includes a chapter on post-mortem examination and laboratory technic. The derivations of the more difficult words are given, an instructive feature. The material is well arranged and a somewhat careful examination has revealed no serious inaccuracies. One's first thought is to mention things that have been omitted but on considering the amount of space at the disposal of the writers one rather wonders how they have included so much. The book is a reliable epitome of pathology. We believe the ordinary histologic classification of tumors, although admittedly not so scientific as that of Adami, would have been more instructive for both students and graduates. On the other hand, Adami's classification of poisons is very much better than the one given.

**Neurotic Disorders of Childhood.**—By B. K. RACHFORD, M. D., of Cincinnati. E. B. Treat & Co., New York, 1905.

The first part of this work is concerned with a consideration of the physiologic factors involved in the neuroses of childhood. One of the most potent of these factors is the abnormally feeble power of inhibition, which occurs in the nervous system of the abnormal child. This functional immaturity of the inhibitory centers is most important in explaining the predisposition of childhood to convulsions, epilepsy, hysteria, incontinence of urine, etc. Chil-

dren are more prone to high and variable temperatures on account of a greater instability of the thermogenic and thermoinhibitory centers. The first section also discusses the relation of neurotic diseases to gastrointestinal toxemias, to autointoxications (thyroid, biliary, uric acid, etc.), to chronic systemic bacterial toxemias (tuberculosis, syphilis, rheumatism and malaria), and to chronic anemia. The second part is devoted to an exposition of the various neurotic disorders peculiar to childhood—tetany, epilepsy, chorea, etc. Each disease is considered in the regulation textbook fashion, but the introduction of illustrative cases adds greatly to the interest and instructiveness of the volume.

**Retinoscopy (or Shadow Test) in the Determination of Refraction at One Meter Distance, with the Plane Mirror.**—By J. THORINGTON, A. M., M. D. Fifth edition, revised and enlarged, with 54 illustrations, 10 of which are colored. Cloth. Pp. 67. Price, \$1.00 net. Philadelphia: P. Blakiston's Son & Co., 1907.

In the fifth edition of Dr. Thorington's well-known monograph the text has been carefully revised, and descriptions of many new instruments, including the electric retinoscope, have been added. The superiority of modern Retinoscopy over all other objective tests makes the constant revision of this standard work most desirable.

**Photoscapy (Skiascopy or Retinoscopy).**—By M. D. STEVENSON, M. D., Ophthalmic Surgeon to the Akron City Hospital, etc. Illustrated. Cloth. Pp. 126. Price, \$1.25 net. Philadelphia: W. B. Saunders Company, 1906.

After the excellent works of Doctors Jackson and Thorington on this subject, at first thought, another work would seem superfluous. A reading of Dr. Stevenson's work, however, inspires a prompt contradiction to such belief. There is not only an attempt to materially explain the technic of this most useful objective method of refraction, but also to elucidate the reasons of the various phenomena observed. The plea for the preference of the name Photoscapy is most convincing, and in his technical descriptions Dr. Stevenson wisely considers the light in the pupillary area rather than the shadow. The author is free in his acknowledgment and praise of his predecessors in this field, and has compiled an excellent bibliography of the subject. We would like, however, to have seen more credit given to the work of the late Dr. Swan M. Burnett, of Washington, D. C., one of the most eminent American pioneers in this field.

**Practical Textbook of Midwifery for Nurses.**—By ROBERT JARDINE, Glasgow. With 49 Illustrations. Third edition, London: Henry Kimpton. Chicago: W. T. Keener & Co., 1906.

A full description of inspection and palpation of the abdomen has been added; also ten new illustrations. The book continues to be a safe guide for nurses.

## CORRESPONDENCE.

### A CASE OF MYOPIC ASTIGMATISM WITH URINARY DISORDERS.

BY

JAMES L. TRACY, M. D.,  
of Toledo, Ohio.

*To the Editor of American Medicine:*—Four months ago a man complained of severe persistent backache; frequent and very painful micturition; dizziness amounting sometimes almost to loss of consciousness; insomnia, and loss of appetite.

These discomforts had resulted in the nervous conditions of the hypochondriac and the neurasthenic. The man was a wood-worker upon the bodies of automobiles; work which required the close use of the eyes. Much of the man's work had to be done while the man was in a stooping position; and, moreover, while in that position he had to exert a good deal of strength, the strain falling upon his back.

He had followed his present occupation about four years, but had first noticed definite symptoms of his present trouble about two years ago. He has no bad habits, is 30 years old, short but well built. The tongue was coated, appetite poor, and he was constipated.

The urine contained large amounts of pus and blood, but I could find no casts. He was myopic, and two years before had gone to an optician, who had given him glasses. He had said that he thought the lenses had helped him some, but that they had not made him feel enough better to pay him for the annoyance of wearing them, so he had only used them when at his closest work.

I am engaged in general practice, but I never treat such a patient as this without first sending him to an oculist. This man had been to good physicians who had treated his urinary, nervous, and other disorders without success; but after he had been fitted with proper lenses, and had been made to wear them all the time when he was awake, he rapidly recovered; and now as I write he tells me that so far as he knows he is well.

The last specimen of urine was centrifugated about six weeks ago, and contained only a very few white cells and no reds.

That organ or system of the body which is being the most severely taxed by the routine of life, is the part which will be first disordered and disarranged by the incessant nagging of discordantly acting eye muscles. This man, for a month, regularly took eucalyptus, then

gradually took the medicine at longer intervals, until now he takes a dose at night occasionally.

This incomplete report lacks a good deal in pathologic exactness; it also is much short of proving that the lenses cured the man, or that the same trouble may not again return while he is wearing the glasses; but the facts are that he kept right on with his work, and instead of growing gradually worse as he had been doing, he gradually got better.

## AN IMPROVED TECHNIC FOR TUBERCULO-OPSONIC PREPARATIONS.

BY

A. P. OHLMACHER, M. D.,  
of Detroit, Mich.

*To the Editor of American Medicine:*—A method by which tuberculoopsonic preparations of unusual beauty can be speedily and uniformly obtained will win appreciation from those engaged in this line of work. Of the several procedures at present recommended each has its faults, and even by those most skilled in their application, the results do not afford the satisfactory finished products of the technic which I shall here describe. By the proposed method one can do away with the specially roughened slide specified in the directions of Wright and his associates; so also the troublesome and uncertain problem of fixation is remedied, and a differential stain bringing them in sharp contrast is obtained for the tubercle bacilli, the nuclei and protoplasm of the leukocytes, and the erythrocytes. I shall assume, of course, that up to the point at which the incubated mixture of corpuscles, serum, and bacillary emulsion is to be spread upon the slide the standard method of Wright and Douglas has been followed.

The slide which I employ for spreading the blood film is the ordinary one, cleaned and polished as is the case when ordinary blood staining is performed. Spreading is done with the slanted edge of another slide, and the thickness of film may vary according to the usual limits.

*Fixation of Film.*—For the purpose of fixing the film it is flooded with 95 percent alcohol, which, after moderate draining, is ignited and allowed to burn off with the film side uppermost. Now the slide, film side down, is passed through the flame three times. The heat of this operation should be short of the degree that will burn the corpuscles, but sufficient to cause the carbol-fuchsin solution, which is immediately flooded over the surface by the aid of a pipet, to steam slightly.

*Staining the Film.*—For the series of operations required to stain the fixed film the following solutions are required: (a) Ordinary (Ziehl's) carbol-fuchsin; (b) nitric acid in 70 percent alcohol in the proportion of 1 part to 30; (c) toluidin blue (toluidinblau, Grüber) in 1 percent aqueous solution; (d) water-soluble eosin (eosin, wasserlöslich, Grüber) in the proportion of 1 part to 500. The steps in the process are these: 1. Stain the heated film momentarily with carbol-fuchsin which should steam slightly. 2. Wash under tap. 3. Flood with the acid alcohol, repeating until the principal excess of color has disappeared. 4. Wash thoroughly under tap. If more than a uniform pinkish hue remains again apply the acid alcohol and perform a second thorough washing. 5. Flood with the toluidin blue solution which should remain in contact with the film about one-half minute. 6. Wash under tap. 7. Stain one-half minute with the dilute aqueous eosin solution. 8. Wash under tap. 9. Stain again with the toluidin blue for one-half to one minute. 10. Wash in water and examine in the same medium under low power. If the proper differential stain has not been secured, repeat the toluidin blue or eosin, or both, as a little practice will indicate. Dry and examine in oil or mount with balsam and cover-glass as may be preferred.

Perfect specimens show the erythrocytes in a grayish-yellow tint, the nuclei of the leukocytes decidedly blue and with nuclear structure clearly defined, the protoplasm of the neutrophile leukocytes a pinkish hue, and the tubercle bacilli brilliant scarlet, while those within the leukocytes can be distinguished by a surrounding clear space or vacuole.

Incidentally I may remark that the eosin-toluidin blue method gives excellent results with all films for opsonic determinations, as of the streptococcus, staphylococcus, gonococcus, pneumococcus, and colon bacillus. I fix and stain the film by immersing it for a moment in a half-saturated solution of alcohol-soluble eosin in 95 percent alcohol. A flooding with 95 percent alcohol to remove the excess of eosin follows, to be succeeded by washing under the tap and staining with 1 percent aqueous toluidin blue, the duration of which while brief, must be determined by practice. The stain of nuclear structures and their differentiation is more intense than with methylene-blue, the protoplasm of the leukocyte should have a pinkish tinge and the microorganism stand out deeply stained and surrounded by a vacuole-like space.

## ORIGINAL ARTICLES.

### ORCHITIS IN TYPHOID FEVER.

#### Report of Two Cases, With Remarks Upon Symptoms and Origin.

BY

NORMAN B. GWYN, M. B.,

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Orchitis not being a common complication of typhoid fever (Kinnicutt's paper, 1901, including but 53 cases) it seems advisable to report two additional instances. The difference in symptoms and course shown by these two cases, occurring at the same time, have induced me also to draw attention to the origin of this complication. This difference in symptoms and course is apparent at once on reading the reported cases, or on investigating the description of the disease in textbooks, many authors for instance, not mentioning pain as a symptom in their descriptions; others state that the absence of severe pain distinguishes typhoid orchitis from the orchitis of mumps and gonorrhea. Horwitz, on the other hand, mentions that in one case in which operation was done by him, the pain complained of was seemingly far more intense than that complained of by patients with gonorrheal infection of the testicle. Differences in the severity of the infection would readily explain the varying intensities of pain in most cases, and the general course, ending either in resolution or suppuration, is explained in the same way. Most cases must be recognized as due to direct local action of the typhoid bacilli deposited in the testicle and epididymis by the blood stream, or less probably helped along the vas deferens by their own motility. Other pyogenic organisms may, of course, cause the complication and have been found in cultures from suppurative cases. It seems probable that in cases due to lodgment of bacteria in the gland and associated with inflammation, the patients must have always a certain degree of pain. I make this statement in this way, because it has appeared to me that in one of my own cases and in many of those reported, the supposed signs of orchitis were not inflammatory conditions, but as suggested

by Widal and later by Hutchinson, were due to conditions produced by thrombosis of the spermatic vein, and hence would not show signs of inflammatory change. Little proof or suggestion, however, is given of the existence of spermatic vein thrombosis in any of the cases, and as we are well aware, few conditions can give rise to more pain in the course of a vein than thrombosis.

In the first of my cases abdominal pain in the appendix region was a marked feature, at once puzzling and overshadowing the slowly swelling testicle, which after a few days diagnosed the abdominal condition to our satisfaction. I am indebted to Dr. Musser for the privilege of seeing and reporting this instance.

CASE I.—A man, aged 40, underwent a severe attack of typhoid, with delirium, tympanites of extreme degree, diarrhea, and a distinct bronchopneumonia during the third week. On the first day of consciousness, severe abdominal pain was complained of about and above the appendix region. Its onset seemed quite sudden and the temperature, which had been falling, rose rapidly  $1.5^{\circ}$ . Although appendicular complication or perforation was considered, the patient's condition did not become aggravated and in spite of localized pain, marked distention (which had already been present many days and during most of the illness), slight rise in pulse and temperature, we were content to wait developments; the absence of an increasing leukocytosis, muscular rigidity, signs of collapse, or failing pulse being our main reasons for being satisfied with the patient's condition. On the third day while exposing the abdomen for examination, it was noticed that the right testicle was much enlarged, principally the epididymis, which with the testicle proper made a mass as large as a small egg. There was absolutely no excessive tenderness; the cord was evidently enlarged but merely as if from excessive blood in the veins; no hardening or tenderness could be detected. We were persuaded at once that the tumescence of the testicle was due to venous obstruction and most likely an obstruction high up in the spermatic vein at about the site of the abdominal pain. The swelling subsided quickly, the pain disappearing by the fourth day. No after-effects were observed. There was no urethral discharge.

The course of the spermatic vein deep in the abdomen, running up to the vena cava inferior

on the right side, is well situated to give pain in the neighborhood of McBurney's point should a thrombus form high up, and the spermatic vein is well constructed for thrombosis. Many of us have seen, and most of us certainly have heard of the abdomen being opened in typhoid fever for abdominal pain due to mesenteric vein thrombosis. It might not be an undue precaution to examine the testicles when puzzling over an abdominal condition in a typhoid case. I do not know of any instance of orchitis in typhoid fever in which abdominal pain so high up preceded the swelling of the testicle. I have mentioned before that the suggestion of spermatic vein thrombosis as a cause of orchitis has already been made, but no suggestive signs of thrombosis in these regions had been in evidence. The case is of interest, then, in that it gives another clue to the origin of some cases of abdominal pain in typhoid fever.

CASE II presents an absolutely different picture. The patient, a priest, had had 14 weeks of the severest typhoid infection, including a cholecystitis. He had come to Philadelphia to convalesce and consulted me for what was probably a subacute bone-marrow infection (the second right rib at its costochondral junction) which subsided gradually. The patient was going about freely at this time. After a day's discomfort in the left testicle he was awakened from sleep by intense pain in this part and in the cord, groin, and immediately above the groin. I doubt if more intense suffering could be possible and repeated hypodermics of morphin were necessary. The testicle rapidly swelled to the size of a goose egg, terribly tender and hard, and for 48 hours, rest was impossible. So far as one could judge the testicle was first attacked, the epididymis being felt as a smaller body. The temperature rose to  $103^{\circ}$  and constitutional disturbance was marked. There was a leukocytosis of 18,000. In three days inflammatory symptoms began to subside, temperature and pulse fell and after eight days all acute symptoms seemed over. The testicle was diminishing slowly in size. After a week, however, the testicle suppurated and broke through the scrotum, taking many days to heal. There was no urethral discharge.

We have here, then, two cases presenting widely different symptomatology and course, due possibly and probably (I feel) to the different

causes of origin: One early, third week, subsequent to a venous thrombosis; the other late (fifteenth week), a result of direct typhoid infection in the testicle. One associated with no pain in the testicle, practically no constitutional disturbances and going on to an easy resolution; the other marked by an unusual degree of pain, marked constitutional disturbance and ending in suppuration and destruction, partial or complete, of the testicle affected. With regard to abdominal pain it must be noted that in both cases pain in some region of the abdomen was complained of. In any acute orchitis the subsequent or coincident involvement of the epididymis and cord gives rise to pain in the groin and low down in the iliac fossa. I do not recall, however, any case in which the painful area extended as high as McBurney's point, or in which the abdominal symptoms prevailed almost to the exclusion of the testicular.

It would be too much to assume that the mild nonsuppurative cases, not associated with constitutional disturbances, fever, leukocytosis, are thrombotic in origin or secondary to thrombosis in the spermatic vein, and that the severe cases represented local typhoid infections, but it seems a reasonable suggestion that acute pain in the course of the spermatic vein, followed by tumescence of the testicle drained by it, is occasioned by thrombosis of this vein and subsequent edematous change, such as the edema of the leg we see following saphenous and femoral vein affection.

One must modify the conclusions made by various authors and say that orchitis in typhoid may be an excessively painful affection and associated with marked constitutional symptoms.

Since Kinnicutt's report, two cases are recorded from France, one from Norway. These, with the present two, bring the number up to 56.

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## PRE-ICTERIC ITCHING.\*

BY

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In his clinical lectures Robert James Graves,<sup>1</sup> the great Irish physician, reports two cases of itching preceding jaundice that are cited by nearly every succeeding writer who refers to the subject. The first case was that of a woman, aged 20, suddenly seized with pain in the right hypochondrium and epigastrium; three days later, and ten days before the jaundice appeared, she began to have excessive itching of the skin preventing sleep. This itching ceased with the advent of the jaundice. In the second case, that of a man laboring under a most severe jaundice, the itching preceded the jaundice by two months and subsided when the discoloration of the skin became established. Graves saw at once that these two cases were irreconcilable with the view that the itching in jaundice depends on a deposition of bile pigment in the skin. Hilton Fagge<sup>2</sup> is authority for the statement that Thomas Addison once suggested that an attack of jaundice might be impending when a patient complained of itching, for which no explanation could be found; the prediction proved correct. Murchison,<sup>3</sup> Budd,<sup>4</sup> and Frerichs<sup>5</sup> mention pre-icteric itching, but cite no observations of their own, referring merely to the two cases of Graves. Quincke,<sup>6</sup> Rolleston,<sup>7</sup> and Osler<sup>8</sup> also speak of it. According to Quincke, Herter attributes the itching to dryness of the skin. In a case of carcinoma of the ampulla of Vater reported by Havilland Hall,<sup>9</sup> severe itching appeared one week before the jaundice, and in a similar case of Halsted's,<sup>10</sup> itching was the first symptom.

Within the last few months three cases of this anticipatory itching have come under my observation.

\* Read before the Section in Medicine of the College of Physicians of Philadelphia, December 10, 1906.

CASE I.—H. G.; physician; aged 33; came to see me on September 1, 1906, deeply jaundiced. He had been well until six weeks before, when he had an attack of cramp in the lower abdomen with vomiting and diarrhea. The pain was not severe; lasted one and one-half hours, and was relieved by a free evacuation of the bowels. He did not feel well afterwards, and two weeks later began to have severe itching of the legs at night. Circular brownish patches appeared upon the skin of the lower extremities and as far up as the waist line. After the itching had lasted a fortnight, jaundice supervened, and with its advent the itching became much less pronounced, but continued in a mild degree until about September 25, by which time the jaundice had disappeared. During the attack, the patient lost a good deal of flesh and strength, due, he thought, to his limiting himself to one meal a day. There was marked dyspnea on exertion, and in the beginning a little fever, up to 101°. The tongue was heavily coated; there was great thirst; the bowel motions were putty-colored; liver and spleen were enlarged, but not tender to touch. There were no heart murmurs. A blood count made on September 1, showed hemoglobin 70 percent; white blood-corpuscles 7,600; red blood-corpuscles 5,300,000. The urine was free from albumin and sugar; acid in reaction; specific gravity 1.019; dark amber, and contained bile. Under the microscope, hyaline and leukocyte casts, cylindroids, and a few bile-stained leukocytes were found.

The attack had a curious sequel. After the jaundice had vanished, the patient began to suffer from pains in all of his bones and larger joints. The slightest exertion was painful; the mere lacing of his shoes, drawing the string over his thumbs, caused pain; turning the handle of the door required a great effort; and even the act of walking was painful. The glands of the neck and in front of the ear were enlarged and tender; there was also a rapid and pronounced loss of hair. This strange symptom-complex lasted six weeks; it was not attended by fever, and the salicylates had no effect upon it. Even now—I saw the patient today—he has not regained his full vigor, although he is free from pain and feels otherwise quite well.

CASE II.—Patrick F., aged 65; white; a native of Ireland; was admitted to the Philadelphia Hospital, September 7, 1906, with intense jaundice. He had not been ill since childhood; had used alcohol and tobacco to excess. About four weeks before admission, he had a severe attack of epigastric pain; and about a week later,

and two weeks before the jaundice appeared, he began to have itching, which was worse at night, and was especially marked in areas where he perspired. While in the hospital his skin was normal to the touch; he would always perspire freely after a hot bath. Scattered over the trunk and extremities were small brownish macules, which had appeared since the development of the jaundice. He was rapidly losing flesh and strength; occasionally it was possible to make out a mass in the right upper quadrant of the abdomen. There were no heart murmurs. A tentative diagnosis of cancer of the head of the pancreas was made, and it was also considered possible that a stone might exist.

CASE III.—M. T.; a young woman; single; aged 28; Austrian; servant; had an attack of epigastric pain five weeks before admission to the Jewish Hospital; two weeks later jaundice appeared. For four days prior to her discovering the discoloration of the skin, she had severe itching of the palms, arms, and back. When I saw her the jaundice had almost disappeared after having lasted about three weeks. The itching continued for two weeks during the jaundice, and was most marked, after the icterus had reached its height, on the chest and back. She perspired but little during her illness. Bile was present in the urine, and was also demonstrated in the blood-serum. There was no murmur over the heart throughout her stay in the hospital. A diagnosis of catarrhal jaundice was made, but it is possible that the patient has gallstones.

In these three cases the pruritus, which as a general rule comes on with or soon after the jaundice, appeared before the latter. This peculiar circumstance suggests a brief consideration of the causation of the itching accompanying hepatic diseases. I think the older view that it is due to a deposit of bile pigment in the skin can no longer be maintained; it was questioned already by Graves, by Budd, by Murchison, and by Frerichs. Rolleston, among modern writers, also doubts whether itching is due entirely to the presence of bilirubin; and admits the possibility that other concomitant poisons may give rise to it, or that the dry, ill-nourished condition of the skin is the cause. Quincke holds that it is impossible to state whether the deposit of bile pigment in the skin has anything to do with the itching.

The following facts, it seems to me, militate

against the view that the pigmentation is the cause of the itching.

1. Itching, according to Frerichs and Lancereaux,<sup>11</sup> occurs in only about one-fifth of the cases of jaundice.

2. It bears no constant relation to the depth of the jaundice.

3. It may come and go repeatedly in a given case, while the jaundice persists undiminished, as in a woman under my care at the present time.

4. The occurrence of itching that appears before the jaundice, and coincidentally runs with it for some time.

5. The prompt, sometimes instantaneous, disappearance of the itching after drainage of the gallbladder is established, long before the jaundice has had time to disappear.

The liver performs so many duties in the economy that when its activity is interfered with, a number of consequences, more or less important, must follow. The most conspicuous, although not the most important, is jaundice, for which the explanation is simple enough, namely the deposition of bile pigment in the skin. Another symptom is bradycardia, generally attributed to the circulation of the bile acids and bile salts. More obscure is the tendency to hemorrhage, which may be due to biliary acids; but this is by no means proved. The cause of the itching is unknown. In all probability it is some metabolic poison, or poisons, which the liver, in its normal state, either neutralizes as it passes through in the portal blood, or destroys when brought to it by the blood of the hepatic artery. Inasmuch as the itching is so promptly relieved when the bile is deflected from the system by a fistula between the gallbladder and the stomach or bowel, or through an external opening, the poison would seem to be contained in the bile. In ordinary cases of icteric itching it enters the circulation with the bile, probably by way of the lymphatics; but in pre-icteric itching or in itching depending upon hepatic disturbances without jaundice, it passes into the blood independently.

The question arises, has pre-icteric itching a diagnostic or a prognostic significance? The

reported cases are too few for a definitive opinion; but it is significant that three out of six cases were malignant. My friend, Dr. M. J. Stern, who has had considerable experience in diseases of the biliary passages, has also noticed pre-icteric itching to occur more often in malignant than in benign affections. Bouchard and other French writers likewise claim that the early advent of itching in jaundice is suggestive of malignant disease.

#### CONCLUSIONS.

1. Itching sometimes precedes the onset of jaundice by a variable length of time.
2. This itching may cease the moment jaundice is established, or it may continue indefinitely.
3. Itching, whether pre-icteric or icteric is not due to a deposit of bile pigment in the skin.
4. When itching exists for which no cause can be found, the liver as a possible factor should not be overlooked.
5. Pre-icteric itching is suggestive, though not pathognomonic, of the existence of malignant disease involving the liver or the biliary passages.

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## NERVOUS DISORDERS OF CHILDREN: THEIR RELATION TO SCHOOL LIFE AND WORK.

BY

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The subject of education in its highest and widest sphere is daily becoming of more practical interest and importance. In the evolution of civilization its supreme value to the individual was never greater than it is today. Much, however, depends upon our interpretation of the true function of education as well as its

practical relation to the demands of our present modes of life and living.

If education, in its broadest significance, embraces, as we are taught to believe, all the elements which enter into and form part of our social fabric, then certainly its chief object is to train individuals to become intelligent, moral and self-supporting citizens, at the same time to eradicate, or at least to modify or to correct, all undesirable tendencies in both mind and body which oppose such a favorable state.

This, therefore, concerns the whole development of the man, his mental, moral, and physical powers and capacities, beside the recognition and correction of any abnormal or pathologic tendencies which may seem to lean toward his social degeneracy. In view of this it is clear that the basic element of all true education is closely allied to the science of medicine; indeed, education is rapidly becoming a medical question of the highest importance. The vital relation of medical science to the proper protection and preservation of the health of the race on the one hand and the prevailing vices and social evils on the other, together with their special relation to public school education is at once self-evident to every unbiased mind. That the truly medical aspect of public education has, until within quite a comparatively recent period, been entirely ignored or overlooked by our prominent educators, is now generally admitted.

The recognition and introduction of medical science in educational methods, therefore, marks a new era in the progress of civilization. Its great object is not simply the detection and prevention of the spread of contagious diseases, but more especially to enforce upon the pedagogic fraternity the great truth that education does not consist in what a pupil can be forced to accomplish in a given length of time, but what are his or her capacities safely to study and acquire that kind of knowledge which is most essential for his or her physical, mental and moral preservation and that of their fellow-man. This embodies the chief elements of good citizenship and this is, or should be the prime object of all practical education. From

this standpoint the education of children should be based upon a purely physiologic foundation, and this, to my mind, is the only logical solution of the primary educational problem. The tendency, therefore, to ignore or make the study of physiology a second class or even optional matter in our public school system should be condemned, as it is largely the responsible agent for much ignorance concerning self, as well as the cause of the production and spread of disease among the pupils. The function of the teacher does not consist merely in imparting knowledge, but in developing character, which again is directly dependent upon the congenital and acquired condition of the nervous system.

As my subject pertains to the nervous disorders of children and their relation to school life and work, it is necessary first to call attention to a few practical physiologic deductions concerning the nervous system and its functions which have a direct bearing upon the theme. All the nervous disorders of children are usually regarded as belonging to one of two great classes, viz., organic and functional. Under the former we include such conditions as inflammations, hemorrhages, apoplexy, tumors, and the various forms of paralysis. They, therefore, comprise the more serious and permanent nervous diseases of children, and their presence usually precludes the attendance of the pupil from school, so that as a rule they are not commonly seen in the schoolroom. The latter, however, embraces such disorders as headache, neuralgia, chorea, hysteria, epilepsy, so-called nervous prostration and feeble-mindedness or dementia.

It is the functional nervous affections, therefore, that are more commonly associated with school life and work, and these I desire more especially to emphasize. That the nervous system in the normal child is constantly undergoing marked changes in both structure and function is certain, and that the former is more rapid in its development than the latter is also a well-established scientific fact. For instance, while the brain at birth is the most immature of all the great organs of the body, yet at the age of eight, it has attained at least 90 percent

of its full weight. Hence, the brain of a child of eight, is almost as large as that of a full grown adult; yet the normal relative power and capacity of each differ enormously, and are usually in proportion as the individual is influenced by the varying conditions of heredity, environment, education and other features associated with modern civilization.

The extreme slowness, however, of the brain cells to attain their fullest power after it has reached almost its full bulk in weight, is one of the most remarkable features of nervous evolution, and in this respect the brain differs from any other organ or tissue of the body, for it is estimated that it takes the brain cells 18 years to attain their highest functional development, and this exceptional law of physiology should always be borne in mind by teachers.

Moreover, we must remember that the highest activity of the brain cell is the faculty of restraint or inhibition, which in common parlance corresponds to the term self-control. Now this power is not only the last of the mental forces to be developed in the successive stages of nervous evolution, but is also the highest of all the powers of the mind, hence the importance of its proper development cannot be overestimated. In addition, we know that the power of self-control is perfected at different rates and degrees at different ages, and no two persons possess exactly the same amount of self-control at the same age, but attain this in graduating proportions according as they are influenced by conditions of heredity, environment, education and other agents referred to. When, therefore, we watch carefully the growth and development of children, we observe that some have the sense of self-control developed much sooner and much stronger than others, while many seem to be entirely destitute of this important mental attribute. Moreover, the power of self-control is also contemporary with the individual's choice of right and wrong, which is again synonymous with the term conscience. We all know that the power of choosing the right and avoiding the wrong, or the conscience sense, presents every degree of development in the child, and even after reaching adult

life some are found wholly devoid of conscience. This is notoriously the case in those whose ancestors for several generations have been insane, criminals, or drunkards.

In some children, however, we find the sense of right and wrong abnormally developed, owing possibly to faulty methods of tutorship or inherent causes, in which case it may present one of two extremes, viz., an undue sensitiveness or an abnormal degree of dulness. For instance, when abnormally sensitive the desire to follow the inclinations to do right and avoid the wrong becomes a severe nervous strain or painful effort. To illustrate, Clouston in his work on "Mental Medicine," says he knew a little boy, aged four, who, by dint of constant rigid tutorship on the part of his mother, became so very sensitive as to what was right and wrong that he never ate an apple without first considering the ethics of the question, whether he should eat it or not. He would suffer acute misery, cry bitterly and lose much sleep at night if he had shouted too loud at play or taken more than his share of the cake at supper, he having been taught that these things were wrong and displeasing to God. On the other hand, the child may lack the fundamental instincts associated with right and wrong, and will take to stealing, lying, and cheating, as ducks take to water, in spite of all teaching. Hence we find the conscience sense may be either hyperesthetic or anesthetic, in which case the conscience becomes seared.

Such abnormal conditions are often due to hereditary defects, bad environment, defective family training, and faulty methods of education. These various weaknesses of children, from whatever cause, are in large measure subject to the proper development of mental inhibition, or the faculty of self-control, which, as before remarked, is slow and gradual in attaining its highest state of developmental perfection, but when unduly stimulated or allowed to become unrestrained, from any cause, defective inhibition or loss of self-control with subsequent impairment or lowering of the child's conscience sense is the inevitable consequence.

Modern medical science also demonstrates

that the cultivation, preservation, and maintenance of health depend almost entirely upon the influence exerted by the nervous system upon the general bodily organs. There is good reason to believe that there is a marked disproportion normally in the child between the power of restraint by the sensory cells of the brain and those of motion. This renders the average child peculiarly susceptible to excessive motor activity, and unless this is judiciously guarded, it leads to the development of nervous diseases which have for their chief symptoms an excess of motion which are expressed in the form of convulsions, hysteria, St. Vitus' dance and epilepsy, all of which are commonly associated with school life and work. Every child is normally predisposed to excessive motor activity, as the sensory restraining forces of the brain are not sufficiently developed to assume full control until a later period of life. This lack of restraint, however, or self-control, in the child forms a very important factor in the production of functional nervous disorders, as well as criminal tendencies. Indeed, the vast increase of juvenile criminology in our cities can be directly traced to the varying causes incident to defective inhibition or lack of development of the power of self-control. Moreover, such conditions, when neglected and allowed full sway, also retard the physical and mental development of the child by interfering with the normal process of nutrition, resulting in an impoverished condition of the blood, which constitutes the basis of so many nervous disorders, and which may be expressed in the form of insomnia, headache, vertigo, constipation, menstrual disorders, spasms, convulsions, tic, chorea, hysteria, epilepsy, and even insanity.

The practical significance of these physiologic principles, when applied to the pupils of our public schools, cannot fail to appeal to every physician, more especially when we consider their relation to the chief causes of the more common nervous disorders of children associated with school life and work. All authorities agree that the most conspicuous and important cause, and that to which all others are subservient, is the transmission through successive

generations of that peculiar bodily condition we term the nervous constitution or temperament. This manifests itself by a general restlessness or unstable condition of the nervous system, which makes itself felt by a constant nervous weakness or tendency to break down under the most trifling circumstances, thus affecting the emotional attributes of the individual, and gives expression in the form of abnormal states of feeling, and nervous irritability, which corresponds to that condition known as the nervous diathesis.

These abnormal conditions of inheritance often come as a result of imperfect growth, defective nutrition, incorrect habits, injudicious education, and modes of life of the parents, the general effects of which tend to lower their general standard of health, while the morbid products resulting from such evils are readily transmissible from parent to child in the form of certain nervous tendencies, which in the offspring is recognized as the nervous diathesis.

As physicians we do not presume to explain all the intricate details concerned in the laws of heredity, or those which govern the transmission of hereditary taints, as these are generally unknown, but the number and diversity of inheritable deviations of structure and function are endless, and when neglected, ignored or even unguarded by proper safeguards, they rapidly give rise to nervous states which may be expressed in the form of headache, neuralgia, St. Vitus' dance, hysteria, epilepsy, nervous prostration, and even insanity. These are the unfortunate features, however, that we as physicians have not only to recognize, but also combat, irrespective of the reluctance of the public to acknowledge or recognize their hereditary origin.

At this point it might be well for me to remind you that this nervous constitution or so-called nervousness may not only be inherited but also acquired, and the person born of healthy parentage can, by the abuse of certain agents, such as tobacco, alcohol, opium, or through acute illness, injudicious methods of education, accidents and injuries, together with physical and mental strain, and excesses of all kinds, produce

this very distressing bodily ailment. Hence it may be both congenital and acquired and assume all degrees of seriousness.

It would be a most distressing as well as humiliating confession of weakness, if, with all the boasted advance of medical science, nothing in the way of relief or cure could be offered these unfortunates who suffer from hereditary defects. In spite of the popular belief that hereditary taints are necessarily incurable, we can in the light of modern medical science certainly declare that morbid inheritance is not, in the vast majority of cases, a mysterious and necessarily fatal doom, certain at some time or other to overwhelm its victim, but can be remedied and even cured, when judiciously treated.

Next to the powerful influence exerted by heredity in both the production and spread of nervous disease, the most potent factor in the causation of nervous disorders of children is the various disturbances of the emotions incident to the formative period of life. These include such conditions as grief, fear, fright, disappointment, mental worry, bad family training, faulty modes of life, injudicious forms of education, lack of exercise, and shocks to the nervous system, due to slight or serious injuries. Such causes are also emphasized by the presence of the common infectious diseases of children, like measles, scarlet fever, diphtheria, rheumatism and other toxic agents, as well as the various stomach and bowel disorders, including dentition, eyestrain, and other reflex irritations. The special tendency, however, of all these various causes is such as to produce morbid changes in the blood, which are usually expressed in the form of anemia, hyperemia, or badly nourished physical and mental conditions which underlie the vast majority of such nervous affections.

The important relation which these nutrition defects, from whatever source, bear to the causation of nervous diseases when subject to the stimulating process of the educational period is not so well understood as their significance warrants. Modern medical science demonstrates conclusively that mental health depends almost entirely upon the development

of the physical organism, and that physical deterioration from any cause is responsible for much of the nervousness so prevalent in the pupils of our public schools. A large number of our school children, by virtue of their bad heredity and neglected or careless modes of home training, are not only neurotic, but pitifully weak and anemic, and suffer from the various serious results of malnutrition. Their nervous systems are in such a weakened state as to render them incapable of accomplishing the grade work, and when subjected to undue stimulation, or pushed in their studies by either teacher or parent, they soon show signs of nervous weakness, which later shows itself as headache, vertigo, spasms, neuralgia, St. Vitus' dance, hysteria, epilepsy, nervous prostration, and even insanity. Herein lies one of the most serious evils of our present school system, which pays little attention to the constitutional differences and defects of its pupils, but has organized its means and methods so that each school can yield a good average "mill product."

Every teacher recognizes that there are pupils in the class who lag behind, who fail to grasp the elementary principles of education like the larger majority of children, and who are difficult to manage, manifesting traits unlike the rest of the pupils, even though they belong to good families, and because of their troublesome deportment and careless methods constantly require a reprimand from the teacher. Such children, on medical inspection, are often found suffering from faulty nervous organizations, due probably to hereditary or nutritional defects, which may also be accompanied with abnormal reflex action, such as eyestrain, habit spasm, or a nervous fidgety state which causes them to squirm in their seats and pay little attention to their studies. Such troublesome conduct disturbs the quietude of the more studiously inclined pupils, and the teacher tries zealously to overcome it, until patience ceases to be a virtue, and the child is finally sent to the principal for punishment. Moreover, as a result of low grades the pupil fails to reach the coveted prize of advancement. This not only has a very distressing effect upon the

child, but also angers the parent, who furiously resents the disappointment. Many a child is, therefore, unconsciously punished in various ways for failure to perform tasks for which it is wholly unfitted, and in order to maintain the strict form of school discipline is often refused favors which its condition demands as the result of irresponsible nervous defects. More especially is this true of females when nearing the critical period of puberty, and males during the transitional stages from youth to manhood.

Not only do these remarks apply to the school children of America, but also of England, as well as Continental Europe, as was recently shown in the *British Medical Journal*, January 7, 1905. Moreover, in a recent editorial in the *Journal American Medical Association* it was shown that one in three of the school children of Chicago is affected with some form of nervous disorder. The causes alleged are the strenuous city life, the impure atmosphere of dwellings, the bringing up of children in flat buildings with deficient facilities for exercise, light, and ventilation, the constant noise day and night, late hours, lack of sufficient sleep and nutrition. Beside the danger of over devotion to study, city children are subject to excitement and social temptations to which those in smaller communities are far less liable.

It would be most unfair as well as most unjust if the prevailing methods of the public school system of America were accused of being the sole cause of the marked increase of the nervous disorders among children. But while this is not true there can be no doubt that it can justly be charged with imposing too heavy burdens upon those who are by inheritance or other causes both physically and mentally unable to cope or compete with those children of more favored ancestry and physical development. We cannot change the child's ancestry, or home training, but as physicians we can speak out against the crime of pushing children with hereditary physical defects to rapid brain development which accentuates existing nervous tendencies until they culminate in actual nervous disorders.

Modern medical science demonstrates that

the mental output of the pupil is directly related to height, weight, and physical measurement, and that there is a physical basis for precocity on the one hand and mental dulness or feeble-mindedness on the other.

Dwarfishness of body does not always mean dwarfishness of mind, but such defect is usually the result of bad heredity or disease, and to some extent at least incapacitates the pupil from reaching the highest intellectual development, as such conditions are usually associated with impoverished blood states.

The trend of modern medical teaching implies that the prime necessity in our school children is to have plenty of bone, blood, and muscle; in other words, to be well developed physically, even if it be at the expense of their education, for there is no doubt that parents too often sacrifice the constitution for what they term educational necessities. Medical science teaches that children of a nervous temperament should be kept fat from birth, and when they arrive at school age their brains should not be forced. As a general rule these children are precocious and hypersensitive, possessing a vivid imagination and keen perceptive qualities. Hence they are recognized as being smart and intelligent—the brightest pupils in the class. Not only do parents and friends admire and compliment their apparent quickness to learn, but their teacher takes great pride in their intellectual cleverness and urges them to push forward to their fullest extent in the hope that they may outdistance all other competitors. In their anxiety to have their child succeed and excel, the parents are often willing to witness the gradual but certain “collapse” of the child from sheer exhaustion, by thus allowing their physical health to become subservient to the intellect. Moreover, parents are even known to employ private teachers to coach their children after the regular school hours, in order that they may gain a certain coveted prize.

The evil results to the nervous system which follow such false methods are too well known to the physician to be lightly regarded, as such children invariably succumb to the wellknown law that teaches that precocity is a sure sign of

biologic inferiority, and should, therefore, not only be discouraged, but also condemned in spite of its apparent educational advantages or promised intellectual rewards. I cannot refrain from referring to a widespread fallacy or popular misconception, which is not only taught and believed, but relied upon so often to the detriment of all parties concerned that it has become almost a public crime. I refer to the belief that the child will outgrow its nervousness and consequently there is no cause for alarm when a child suffers from the various forms of nervous weakness. Such teaching is not only misleading, but absolutely false, and contrary to all medical knowledge and experience, and the sooner this fact is well understood by both parent and teacher, the better, for it will save many a boy and girl from becoming a confirmed neurasthenic, hysteric, or epileptic. The evil results attending such a pernicious doctrine has been often impressed upon me, and strange as it may appear is quite often due to ill advice offered by the family physician, whose faulty education prevents him from realizing its fallacious character as well as the true seriousness of such erroneous misguidance on his part. The parents are too apt to treat indifferently the earlier manifestations of nervous disorders, and this unfortunately is seconded by a widespread notion among even the more intelligent to the effect that these mild and simple morbid manifestations are purely imaginary, or at least are mental in origin, and that symptoms are not evidence of real disease.

However, modern medical experience demonstrates that nervous diseases are very real in character, and in their incipency are more curable than at any other time, but when neglected, culminate in serious permanent disabilities. Such an occurrence as a fainting attack or a mild spasm, or even convulsion, should, therefore, not be considered such a trifling affair, as it may be the initial warning of an oncoming epilepsy or hysteria. The fidgety, squirming, spasmodic twitching, or the peculiar periodic nodding of the head or strange grimace of the school boy or girl, while not considered of sufficient importance to be given any special concern in their

earlier incipency, may, if neglected, develop into a serious and permanent form of St. Vitus' dance, or other nervous disease, which the parents forever regret, as the result of their own gross indifference.

A brief glance at the symptoms which accompany the functional nervous disorders of children demonstrates them as representing either an increase, decrease, or perversion of the functions of the nervous system involved in the morbid process. Hence we find that they largely pertain to disturbances of motion, sensation, reflex action, the mental faculties, and the visceral organs, all of which are more or less dependent upon nutritional or trophic defects.

For instance, the chief disturbances of motion are seen in convulsions, spasms, tremors, and the various forms of paralysis, a combination of which so often accompanies such diseases as St. Vitus' dance, hysteria, and epilepsy.

Perhaps the chief disturbance of sensation is expressed in the form of pain, which may present itself in all degrees of intensity, and if pain is what we are told it is, viz., "the prayer of a nerve for healthy blood," we can readily understand the origin of such conditions as headache and neuralgia. The mental symptoms present quite a variety of morbid manifestations, but the principal ones are dizziness, fullness of the head, insomnia, morbid introspection, morbid fears, despondency, mental apathy, hilarious excitement and even delirium. These are commonly associated with disturbances of the visceral organs, due often to either too much or too little food coupled with an excess of candy or other confectionery; the resulting symptoms consist of indigestion, flatulency, palpitation, biliousness, constipation, nausea, and vomiting, with all degrees of fever and general malaise. The nutritional symptoms are seen in either anemic or congestive states, as well as all degrees of exhausted or wasted conditions of the body.

Such children are usually thin, pale, and badly nourished, yet are often mentally precocious and quick witted, beside highly sensitive to all kinds of impressions as well as suggestions, both mental and physical. They are, of all

children, the most liable to break down under the stress of the educational period. Occasionally we find the nutritional defects presenting the reverse of these conditions, and a few may be found suffering from abnormal blushing or mild congestive states, as well as skin eruptions, which, when confined to the face, prove the source of great annoyance because of their misleading character.

In view of these facts, it is exceedingly gratifying to know that a system of medical inspection of public schools is already in force in most of the larger cities, for this cannot fail to yield fruitful results in both the prevention and spread of disease among the pupils.

The report of the medical inspection of the New York public schools for 1904 shows that during the past year no less than 41,826 children were found suffering from the various contagious and other diseases which excluded them from attending school. So far, such medical inspection has been largely limited to the detection and prevention of contagious and transmissible diseases among the pupils, and while this is a step in the right direction and deserves every encouragement, yet I am certain that if we hope to overcome the present physical deterioration so prevalent among the children of our public schools and its consequent nervous tendencies, we must of necessity adopt other measures than those now being enforced. Indeed, no intelligent person can read this report of the New York medical inspectors without being convinced that while much is being accomplished for the public good, much still remains to be done in order to overcome such public evils. Among the conditions over which the inspectors claim they now have no control is the exclusion of all nervous diseases, and the separation of children with inferior mentality. In my judgment, a very important agent and one which so far has largely been ignored in the prevention of nervous diseases of children is the enforcement in our public schools of the principles embodied in the science of anthropometry.

What seems necessary to help overcome the physical deterioration that now underlies both

precocity and mental dulness, as well as other nervous conditions, is to fix certain definite standards of weight and measurements for every age and height, and any pupil found above or below this fixed standard should be placed in specially arranged classes. It is possible that such a method might work harm to the few, but the greatest good to the greatest number must and should always be the principle upon which our public school system should be governed, and the method suggested would certainly obviate many existing evils. The practical utility of such a method has already been demonstrated by Dr. Dudley Sargent of Harvard University, and Dr. Seaver of Yale, both of whom highly commend its practical utilization in the public schools.

### CHRONIC APPENDICITIS.<sup>1</sup>

BY

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In 1886, Fitz, of Boston, demonstrated that the inflammations in the right iliac region which for a long time had been known under the terms typhilitis and perityphilitis, were really due to disease of the vermiform appendix. In the 20 years that have elapsed since the publication of Fitz's paper, acute appendicitis has been the subject of world-wide study and observation, so that although there are many matters of detail on which differences of opinion still exist, the general principles relating to acute appendicitis are recognized, accepted, and acted upon by the profession at large.

I, therefore, do not propose to speak of acute appendicitis but to limit my remarks to a consideration of chronic inflammation of that organ and more specifically, to one variety of chronic appendicitis. The cases of chronic inflammation of the appendix group themselves into three classes.

1. The recurrent cases, in which there are repeated attacks of acute inflammation of the appendix with intervals of longer or shorter duration in which there is freedom from symptoms.

2. The relapsing cases, in which there are constantly present, symptoms referable to the appendix and in which there are from time to time, acute exacerbations of the disease.

3. Cases in which the inflammation is subacute or chronic from the beginning and in which the patient at no time has had an attack presenting the symptoms which we recognize as those of acute appendicitis. It is to this latter group of cases that I desire briefly to direct attention.

While, for many years, we have all recognized the importance of early diagnosis and prompt treatment in acute appendicitis and in the recurrent and relapsing varieties, yet it is only of late that the existence of this chronic form of the disease has begun to be recognized and we have come to realize that many cases of chronic illness, with symptoms referable to the abdomen, have their explanation in the condition of the appendix.

Chronic appendicitis may follow an acute attack of the disease, or it may originate as a subacute or chronic inflammation beginning in the mucous membrane and extending to the muscular and peritoneal coats of the appendix, or it may be the result of extension of inflammation from neighboring organs as the fallopian tube or ovary.

The chronic inflammatory process leads to hyperplasia and overgrowth of the appendix so that it presents itself as an enlarged, hardened, thickened, congested tube. The inflammation of the mucous lining may be sufficiently severe to cause ulceration which in healing leads to stricture of the canal. Again, the evidences of inflammation may be most marked in the peritoneal coat, leading to the formation of adhesions between the appendix and neighboring organs and to contraction of the meso-appendix, producing twists and kinks in the organ itself and interfering with its normal range of movement. It is probable that it is to this condition of adhesion and peritoneal contraction that many of the symptoms of chronic appendicitis are due. The chronic inflammatory process may go on to connective tissue contraction leading to obliteration of the lumen of the canal, constituting the condi-

<sup>1</sup>Read March 19, 1906, before the Northeast Branch of the Philadelphia County Medical Society.

tion known as appendicitis obliterans, or it may even lead to atrophy of the appendix itself. This result may be due to the connective tissue change, or, as has been suggested by Kelly and Hardon, it may be a process of involution which is a demonstration of the retrogressive character of the organ.

Closely allied to the question of chronic appendicitis, is that of malposition of the appendix due to congenital defects of development in the mesoappendix and its vessels to which attention has been directed by Joseph A. Blake,<sup>1</sup> of New York. This writer reports a number of cases presenting symptoms indicative of chronic appendicitis in which operation was performed. No evidences of inflammation were found but the appendix was drawn into abnormal positions and presented kinks and twists due to relative shortness of the mesoappendix, apparently the result of lack of development. When the mesoappendix was released, the appendix straightened out and assumed a normal position. In a number of such cases, treated by removal of the appendix, the symptoms which previously had been present and had given rise to much suffering and disability, disappeared and did not return.

The symptoms to which chronic appendicitis gives rise are largely those of functional disturbance and are very diverse in character. One of the most striking features, and one which many of these cases present, is the occurrence of sudden attacks of severe abdominal pain of the character of colic without apparent cause, associated sometimes with vomiting, sometimes with diarrhea. As an illustration of this point it will be of interest to refer to one of the earliest recorded cases of chronic appendicitis and one in which a remarkably accurate diagnosis was made considering the state of our knowledge of this disease at that time. The case was reported by Dr. Thomas G. Morton,<sup>2</sup> of this city in 1896.

The patient, a man of 34, had for eight years suffered from terrible attacks of abdominal pain referred to the epigastrium and left inguinal region, followed by general abdominal soreness lasting for one or two days. He never suffered from pain on the right side of the abdomen. At times there were symptoms of

vesical irritation. These attacks of pain occurred on an average once a week, sometimes often. The temperature was normal. Gallstone and renal calculus were excluded. On careful examination during an attack it was possible to palpate the appendix which felt hard and round like a lead pencil and on deep pressure some tenderness was elicited. The abdomen was opened and the appendix, three inches in length, was found with its tip extending into the pelvis and bound down by adhesions. Half an inch from its attachment to the cecum, the appendix diminished to the size of a mere thread and in attempting to apply a ligature, dropped off. The lumen at this point was entirely obliterated. In the distal portion was found a gritty concretion one-eighth of an inch in diameter and one and one-half inches in length. The patient recovered with entire disappearance of the abdominal symptoms.

In one of the cases which I shall report, the patient exhibited, in an intense degree, this feature of extreme spasmodic abdominal pain.

These attacks of pain may be really of the nature of appendicular colic due to the efforts of the appendix to free itself of retained secretion or of fecal matter which may have become lodged within it. In other instances, it is probably an intestinal colic due to the functional digestive disorders induced by the chronic disease of the appendix. In still other cases, the pain is undoubtedly due to the dragging and pulling on peritoneal adhesions produced by displacement of the organs by the distention of the cecum and intestine by gas.

The abdominal pain may not be of this intense cramp-like character but may be present in the form of a constant, dull, aching soreness in the right iliac region, often increased by movement or jarring of the body. This pain which is increased by walking and other movements may, as has been pointed out by Bryon Robinson,<sup>3</sup> be an indication that the inflamed appendix is in contact with or adherent to the psoas muscle.

Closely associated with this matter of abdominal pain, is dysmenorrhea which is a common symptom of chronic appendicitis; and the converse also holds true that in many cases, dysmenorrhea is due not to disease of the uterus or ovaries but to lesions of the appendix. The

increased pelvic blood supply during menstruation would serve to explain the increase of discomfort in the appendix at this time. Abnormal conditions of the appendix are frequently found associated with tubal and ovarian disease especially of the right side, and the reason for this is readily explained by the close anatomic relations of these organs. It has been held by some writers, as for instance MacLaren,<sup>4</sup> of St. Paul, that chronic appendicitis is more common in women than in men, and it has also been noted that in women, acute attacks of appendicitis are more apt to occur at the menstrual periods than at other times.

Tenderness on pressure is an important diagnostic sign, in the differentiation of chronic appendicitis, and in practically every case it can be elicited in the region of the appendix. In some of the cases which I have observed, the patients have volunteered the statement that the tenderness in the right iliac fossa was most marked in a space about two inches in length and half an inch in breadth and careful palpation has seemed to verify the correctness of the assertion. In a certain proportion of cases in which there is relaxation of the abdominal walls, it may be possible to palpate the enlarged appendix, but in the majority of the cases of the type under consideration this is probably impossible.

Functional disorders of digestion are extremely common accompaniments of chronic appendicitis. Nausea and vomiting, alternating diarrhea and constipation and flatulence are often met. The abdominal distention in some instances tends to localize itself in the ileocecal region probably due to interference with the normal muscular contraction of the cecum. The complexus of symptoms of disturbance of digestion to which the term "biliaryness" is applied, has been attributed in certain cases to chronic disease of the appendix. This matter has been dwelt upon by Battle and Corner<sup>5</sup> who suggest the following explanation. The appendix, the seat of chronic inflammation, becomes unable to empty itself completely on account of the resulting imperfect peristalsis. As a consequence, it becomes a culture field for all the organisms of the intestine. This

may cause symptoms in two directions. First, the absorption of toxins elaborated by bacterial action primarily in the appendix is associated with a chronic toxemia with lassitude, depression of spirits, heaviness of mind, and general depreciation of health with dyspepsia, constipation, colitis, etc. Second, the cecum may become infected from the appendix producing a chronic typhilitis which leads to interference with the muscular action of the cecum. The clinical consequence of this change is diarrhea and constipation in alternation. The ultimate result may be a colitis with the passage of mucus in the stools.

The role played by chronic appendicitis in the production of chronic inflammation of the large intestine and also of mucous and membranous colitis has been dwelt upon by other writers, as for instance Lockwood<sup>6</sup> who attributes the inflammation of the colon to extension by direct contiguity of structure, or to interference with the nervous mechanism of the bowel. The occurrence of chronic irritability of the colon with mucous stools in association with appendicitis, has been studied by George Erety Shoemaker,<sup>7</sup> of this city, who reports a number of cases showing the intimate relation between these two conditions.

Symptoms referable to the nervous system are not infrequent in chronic appendicitis, and take the form of mental depression and general nervousness. In some cases, these are due, as has already been suggested, to a form of auto-intoxication. In other instances, they are undoubtedly the result of the depressing influence of constant abdominal discomfort, and in still other cases, they are due to the mental strain from the constant apprehension of the occurrence of intense abdominal colic.

In the variety of chronic appendicitis which we are now considering, the pulse and temperature show no variation from the normal, unless there is an acute exacerbation of the inflammatory condition and then the case falls into the category of recurrent or relapsing appendicitis. It must, however, be borne in mind that an acute inflammation of the appendix, may very readily be brought on in an organ

already the seat of chronic disease, and some writers have held that acute appendicitis does not develop in a previously healthy appendix but that there must have been some preceding condition, perhaps not severe enough to give rise to symptoms, which has favored the retention of secretion and the formation of toxic material.

In the milder cases of chronic appendicitis and in those cases in which the evidence is not sufficient to warrant a fairly probable diagnosis, the treatment must be directed to the relief of the gastrointestinal and other symptoms by means of improvement of the general health, by regulation of the diet, and by the administration of drugs such as pepsin and bismuth to assist digestion, or as silver nitrate and belladonna, which perhaps have an influence on catarrhal affections of the intestinal mucous membrane. When, however, the disease is of some duration and the condition incapacitates the patient and careful observation of the case has shown that the appendix is the probable seat of the trouble, operation would seem to be logically indicated, and this is especially true in women in whom we find associated evidences of right-sided tubal or ovarian disease.

The histories of the following cases of chronic appendicitis, in which I have operated during the past year, illustrate most of the points to which attention has already been called.

**CASE I.**—Mrs. X., aged 36, married, never pregnant, consulted me in June, 1904, on account of severe dysmenorrhea which had existed from the beginning of menstruation at the age of 14. The pain was extremely severe, compelling her to remain in bed for two days at each period. Menstruation was normal as to time and not excessive in quantity. Examination showed the uterus to be strongly anteflexed and the cervical canal narrowed. Forcible dilation of the cervix under ether was followed by decided amelioration of the dysmenorrhea.

I was again called to see this patient, December 1, 1904. She was then suffering with severe pain in the right iliac region with a temperature of 103°. The pain had been present for two days, had come on suddenly, was paroxysmal in character and associated with some discharge of blood from the vagina. The lower right abdomen was sensitive on pressure, but no

special tenderness over the region of the appendix could be demonstrated. Bimanual examination showed the uterus and left ovary to be normal and the right ovary somewhat enlarged and exquisitely sensitive. A careful consideration of the signs and symptoms present seemed to warrant a diagnosis of acute inflammation of the right ovary rather than one of acute appendicitis. At this time it was learned, that four years previously she had for five or six months suffered from a great deal of discomfort and dull pain in the right iliac region. This pain interfered with walking and she felt as though the right leg were drawn up. She did not consult a physician and the discomfort gradually passed away. A few months later, she had a similar attack which was diagnosed by a homeopathic practitioner as appendicitis. So far as could be learned, these attacks were not accompanied by fever. Since the second attack there had been a constant sense of discomfort in the right side, sufficiently severe to interfere with walking and the comfortable performance of her household duties. The attack in December gradually subsided and in two weeks she was out of bed. The right ovary, however, continued enlarged and sensitive and the tenderness and discomfort in the right side remained. The diagnosis of adherent and chronically inflamed ovary with probable chronic appendicitis was made and operation was determined upon.

The abdomen was opened one month later. The left ovary was normal. The right ovary presented several small cysts and was adherent and was removed as was also the fallopian tube. The appendix was two and one-half inches in length and closely adherent to the colon extending upward in its long diameter. The adhesions were so close that the appendix had to be dissected from the bowel. The appendix was removed, the stump cauterized with the Paquelin cautery and ligated. Recovery from the operation was uneventful. Over one year has now elapsed since operation. There is at present very little pain at the menstrual periods. There is still some slight abdominal soreness following fatigue from long walks or from being on her feet all day. In other respects, she is in excellent health. Previous to operation, her disability was so great that she and her husband had decided to give up housekeeping, but now for the past year she has attended to her social duties and her household work without discomfort.

**CASE II.**—Miss Y., aged 27, unmarried. Menstruation appeared at the age of 14 and was

always regular as to time and amount, but was always attended with severe pain, most marked in the right side. The pain was usually so severe as to require her to go to bed for one or two days and often necessitated the use of an anodyne. For the first few years after the establishment of menstruation, she did not experience any special discomfort between the periods. The dysmenorrhea, however, continued and increased in severity. Medicinal treatment was persisted in without improvement and finally a vaginal examination was made which showed marked ante flexion of the uterus and some tenderness in the region of the right ovary. The cervical canal was thoroughly dilated under ether in September, 1903. This, however, gave very little if any relief to the dysmenorrhea. About two years ago, she began to suffer from discomfort in the right iliac region between the periods. This pain was of a dull, aching character and increased by movement. It was constant and prevented her from doing the simplest work about the house and gradually led to a condition of marked mental depression. Functional disorders of digestion were also present. The right ovary was enlarged and sensitive and there was distinct tenderness in the region of the appendix. Local treatment by means of glycerin tampons, etc., directed to the relief of pelvic congestion, afforded temporary relief but there was no permanent improvement.

General and local treatment failing to afford any real benefit and the patient evidently drifting into a condition of chronic invalidism, operation was recommended and on August 5, 1905, I opened the abdomen by median incision. The right ovary was adherent, slightly enlarged and presented several small cysts. It, with the fallopian tube, was removed. The left ovary was normal. The appendix, about three inches in length, was thickened, hardened and erect, presenting evident distention of the capillaries. There were no adhesions. The mesoappendix was ligated, the appendix removed, the stump sterilized with liquid carbolic acid, tied, and dropped. Recovery was uncomplicated. The immediate change in this patient was truly remarkable. Within three or four days after operation, from presenting the long drawn face of constant suffering on which it was impossible to induce a smile, she became a happy, laughing, joking girl. Since operation she has steadily and continuously improved in health. She has completely lost the pain in the right side. She enjoys life, is able to work and to go where she wishes. She, however, still has some discomfort for a few

hours at the menstrual periods but not sufficiently severe to compel her to lie down. As soon as the flow is established, the pain ceases and there is no further trouble.

CASE III.—Mrs. Z., aged 33, married, the mother of five children. Menstruation began at the age of 15, and was always regular and unattended by pain. Thirteen years ago, she had her first attack of abdominal pain and subsequently she had an attack about once each year. These attacks seemed to be concurrent with constipation. Eight years ago, the spells of pain began to come more frequently until they at times occurred as often as two or three times a week. During pregnancy, she was free from these attacks of abdominal pain. Following the birth of the last child, which occurred about five years ago, she was fairly free from the attacks for two years. The trouble then returned, the attacks recurring at short intervals, increasing in severity and continuing until the time of operation. These attacks have always been similar in character. The patient, while apparently in perfect health, attending to her work, or perhaps in church, or on the car, would suddenly experience what she described as a queer chilly sensation. Within three or four minutes this would be followed by an intense pain extending entirely around the lower part of the abdomen, not especially severe in any one place. Within half an hour the bowels would begin to move freely, often associated with a condition of tenesmus lasting for an hour or more. The stools were of a pasty consistency, of an offensive odor, greenish in color and often contained mucus. After free evacuation from the bowels, the diffuse pain would cease, to be followed by soreness localized in the right iliac fossa and a condition of intense exhaustion which would remain for one or two days. These attacks were unattended by fever. She would then return to her ordinary condition of health until another attack developed. With the attacks were often associated, nausea and vomiting. The occurrence of the pain seemed to have no relation to the character of the food taken, often occurring after the simplest diet and not following the use of indigestible articles. During the attacks there was localized distention of the abdomen in the ileocecal region. During the past three years an attack has always appeared at the menstrual period. During the last year there has been added a constant discomfort in the right iliac region. Raising the hand above the head, walking, or extending the right leg, gave rise to a drawing sensation. Exertion

or walking is liable to bring on an attack of abdominal pain.

Six months ago, she developed an extremely nervous condition with mental depression, amounting almost to melancholia, with spells of crying, in which she was unable to sleep or to attend to her work. This change was especially noticeable in this case as normally she is of an extremely cheerful and lively disposition. There was no disturbance of menstruation and no uterine symptoms. Physical examination showed the uterus to be small and movable with a slight laceration of the cervix. The left ovary was apparently normal and the right ovary presented nothing abnormal with the exception of occasional slight tenderness. There was some tenderness on pressure over the region of the appendix but not to a marked degree.

October 5, 1905, I opened the abdomen through a median incision and removed the right ovary and tube and the appendix. The ovary presented little deviation from the normal. The appendix was two inches in length and adherent at its tip to an epiploic appendage. The organ was not over one-eighth of an inch in diameter and its lumen was much contracted and in fact at one point seemed to be obliterated. Operative recovery was prompt and satisfactory. There has been no attack of abdominal pain since operation. Menstruation is normal and free from pain. Appetite is good and digestion excellent. She is able to eat any class of food. Bowels are regular. The mental condition is now perfectly normal. She takes long walks and trolley rides, she attends to her household duties and leads a busy active life without discomfort.

In conclusion, I would say that my object in offering this communication is not to present an exhaustive essay on chronic appendicitis, but rather to direct attention to this disease which is not uncommon and which is often present in an insidious form and which a critical investigation proves to be the cause of abdominal symptoms of obscure origin which are met in many cases.

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## RUPTURE OF THE COLON FROM VIOLENT PERISTALSIS PROBABLY INDUCED BY FECAL IMPACTION.<sup>1</sup>

BY

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Perforation of the intestinal wall, at some point weakened by a local lesion usually of ulcerative character, is a familiar fact in pathology. Such perforations, perhaps, usually occur at the moment when more or less strong peristaltic movements increase the intraintestinal pressure. In a rather careful search of the literature, I have been unable to find any reference to a more or less extensive tear or rent of the intestinal wall thus produced in the absence of a palpable lesion easily determined macroscopically.

The following case has, therefore, appeared to me to be sufficiently rare, if not unique, to justify a brief note concerning it, even though a proper study of the specimen was not permitted.

The patient, Mrs. H., aged 42, married, was referred by a physician from an adjoining town, March 18, 1905.

There was a history of chronic constipation with considerable gaseous eructations with headaches and other evidences of disorder of the digestive organs. Nine months prior to my examination, abdominal pain appeared as a troublesome symptom, starting in the left lower quadrant and traveling over the line of the colon in the reverse direction. These symptoms increased in severity and the peristaltic waves could be distinctly seen through the abdominal wall. The symptoms became so severe that a laparotomy was done by a surgeon three weeks before I saw the patient, for the purpose of relieving a possible partial obstruction due, perhaps, to inflammatory bands or adhesions, but nothing of this character was found. A salpingitis and diseased ovary were found and the tube and ovary removed but no relief was obtained.

The patient was sent home for a few weeks to allow the abdominal wound to become strong enough to resist the straining incidental to

<sup>1</sup>Read before the American Gastroenterological Association, Boston, June, 1906.

stomach examinations, when she returned for further investigations. Physical examination was substantially negative with the exception of slight enlargement of the liver. A test-meal showed a complete absence of free hydrochloric acid. There was no Gunsberg reaction although there was a little color with the dimethyl which was probably due to lactic acid, a small quantity of which could be determined by Uffelmann's test. The fasting stomach in the morning contained considerable debris made up principally of mucus, glandular and epithelial cells.

The colon contents consisted largely of small round hardened masses of feces, considerable fine mucus, numerous leukocytes, starch cells and meat fibers being found microscopically. Analysis of the urine was negative with the exception of indican in moderate amounts. Hemoglobin was 70 percent with 9,000 leukocytes.

Excluding stenosis on the basis of a laparotomy, I expressed the opinion that the violent peristalsis of the colon was excited by the mass of fecal matter in its lower segments which it was unable to propel onward. This would amount, in fact, to a temporary obstruction which was finally overcome by laxatives and enemata and the patient relieved until reaccumulation took place. This was indeed borne out to a large extent by the history of the case, the different exacerbations being associated with accumulations of fecal matter. The treatment instituted included the free use of strychnin hypodermically, the use of laxatives so far as required, supplemented by colon lavage, a carefully regulated diet and the local use of electricity.

There was considerable improvement in the course of one or two months and there seemed a fair prospect of entirely overcoming the trouble in the course of time. One evening, however, she ate an unusually full meal which was followed by symptoms of indigestion.

On the following morning the spasmodic pains already described and which were undoubtedly due to a violent peristalsis of the colon, became very severe. While walking in the yard she was seized with intense pain and passed rapidly into collapse and died in the course of a few hours before anything in the way of an exploration could be done.

The autopsy was made by the attending physician and I was unable to be present. At the splenic flexure of the colon, there was found a tear extending two or three inches in a longitudinal direction, through which the colon contents escaped into the peritoneal cavity with rapidly fatal result. A careful

dissection of the colon below the laceration showed a distinct narrowing of the lumen of the tube amounting to a moderate stenosis, although it was not sufficiently marked to permit its discovery by manipulation at the time of the surgical operation. Within this narrowed portion and above it, there was considerable fecal matter producing a partial obstruction at this point and the laceration was clearly the result of an extremely violent peristaltic wave in attempting to force the colon contents through this portion of the tube.

The attending physician was forbidden to remove any part of the intestine for examination but there was nothing in the nature of an induration or an ulcerative process or anything else which could be determined by inspection or palpation carefully made. There may, of course, have been some degenerative process which involved the muscularis and so far weakened the intestinal wall as to allow it to give way under the pressure. In the absence of a histologic examination such a possibility cannot be denied but so far as a macroscopic examination, made by a very careful, intelligent and conscientious physician could determine the colon wall at the seat of the laceration was normal in character.

Another case somewhat similar to this so far as the peristaltic movements is concerned was under observation for a short time.

The patient was a young lady of about 25, and the peristaltic movements were not especially painful but could be seen distinctly along the line of the colon in both the direct and reverse directions, associated with a violent churning of the contents giving rise to sounds which could be heard at times 75 to 100 feet away. This patient was extremely neurotic but also had a tuberculous history, one of her sisters having since died of tuberculosis. I advised the patient to remain in the hospital long enough to make a thorough study of the case with the view of possibly advising an exploratory laparotomy but she did not see fit to do so and disappeared from view.

Both of these patients were of a neurotic type and it is very probable that in both there was slight obstruction to the onward movement of the colon contents and that the resulting violent peristalsis was in a large measure the result of indeterminable morbid nervous impulses.

In the fatal case which is the special subject of this paper, it would seem as though the laceration must have occurred in connection

with the direct and not with the reverse peristaltic contraction. The failure to find the slightly narrowed portion of the colon during the operation emphasizes the difficulties of intestinal exploration by surgical procedures. In the absence of induration or marked distention of the proximal segments of the intestine the detection of moderate grades of stenosis must be extremely difficult and under certain conditions impossible. Such experiences show that the most scrupulous care should be exercised in examining the entire length of the colon and that the question should be seriously considered in each case as to the propriety of resection of a segment of the colon even if moderately narrowed, although, as in this case, fecal matter undoubtedly may pass the opening and under favorable conditions without difficulty.

## THE TREATMENT OF CARDIAC DILATION IN PULMONARY TUBERCULOSIS BY MEANS OF ARTIFICIAL NAUHEIM BATHS.

BY

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Having been convinced that a certain number of tuberculous patients fail to respond to the usual treatment mainly on account of heart weakness, I determined to try the Nauheim treatment baths in those cases in which there was demonstrable cardiac dilation and in which the amount of pulmonary involvement was still relatively slight. So far as I am aware no cases have been reported in which this method was employed.

Two patients were selected from the wards of the Phipps Institute which fulfilled the conditions mentioned, and were given a series of baths. Both patients were young men without arteriosclerosis, and both showed wellmarked enlargement of the cardiac dulness, accompanied with a rapid pulse and dyspnea on exertion.

The baths were prepared of the four different strengths, as follows: No. 1. Sodium chlorid, 4 pounds, calcium chlorid, 6 ounces. No. 2. Sodium chlorid, 5 pounds, calcium chlorid, 8 ounces. No. 3. Sodium chlorid, 6 pounds, calcium chlorid, 10 ounces. No. 4. Sodium chlorid,

7 pounds, calcium chlorid, 10 ounces, sodium bicarbonate, 1 pound, hydrochloric acid, 25 percent, 12-20 ounces.

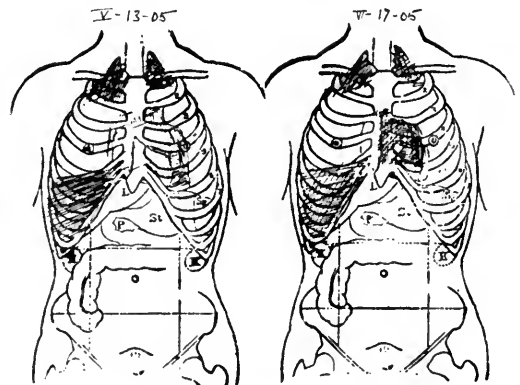
The first bath was given at a temperature of 95° F. and was of four minutes' duration. Twenty-one baths were given in all, the strength of the bath being gradually increased, its duration prolonged, (the final bath lasted 20 minutes,) and the temperature lowered (the last bath 80° F.).

The patient was required to rest in bed for half an hour before, and one hour after the bath. The pulse was taken immediately before, ten minutes after, and one hour after the bath. No stair climbing was allowed until near the end of the treatment; in Case I the patient was taking minute doses of strychnin thrice daily during the greater part of the time. Before treatment was commenced the pulse range was much greater than after the same. The temperature chart shows gradual and steady decline of rate as the result of the baths. Resisted exercises were practised only a few times.

CASE I (3036).—J. H., male, aged 26. Probable source of infection from father.

Past History.—Pertussis, measles, right-sided pneumonia, and parotitis.

Chief Complaint.—Precordial pain, attacks



CASE I.

of sinking feeling, dyspnea on exertion. Tuberculin reaction positive.

Urine: 1028, Diazo negative, no albumin or casts, no glucose (several examinations).

Highest weight 118 pounds, three years ago;

at first visit 95, on admission to ward 105. Chills and night sweats, pulse range, 98.4-99.6; respirations, 15-25.

May 13, 1905. Heart: First sound at apex, poor muscular sound, no murmurs, no accentuation. Pulse, recumbent, 84, erect, 98. Apex beat diffuse over larger area than normal, in sixth interspace in midclavicular line. Pulse fairly regular as to force and rhythm while recumbent; volume when erect as shown by sphygmograph, smaller and more irregular. Blood-pressure with Stanton instrument 150 mm. For heart dullness, see chart. (Fig. 1.)

Lungs: Infiltration of both apices, most marked on right.

May 15. First bath, patient neurotic, and timid in bath. Pulse before bath 90, after, 86.

May 17. Pulse before bath 102, 10 minutes after, 92, one hour after, 70.

May 19. Pulse before bath 98, 10 minutes after, 86, one hour after, 82. Blood-pressure seemingly unaffected by bath.

Seventeen baths were given in all, with two and three day's intermission. There was a distinct response in each case as shown by decrease in pulse rate, and by lessening of the daily range.

June 17. Weight 120½ pounds, range of respirations 15-20, of temperature, 98.4°-99°.

Examinations of cardiac dullness were corroborated by Dr. Walsh. The patient states that he has no more attacks of "sinking" in the precordium, and that he feels much better than before the treatment.

As is shown by the diagrammatic drawings there is well-marked diminution of the cardiac dullness on both the right and the left sides of the sternum.

CASE II.—J. W., male white, aged 30. No history of infection obtainable. The patient had typhoid fever several years ago. His health has been failing for three years, dyspnea on exertion.

Highest weight, 150 pounds four years ago. On admission his weight was 108 pounds. At time of discharge 122½ pounds.

Lungs: Involvement of both apices, most marked on the right; at which site there seems to be a cavity. Possibly a small cavity also near right axilla.

Heart is distinctly enlarged as shown by chart, (Fig. 2.) both to right and left. Rhythm regular, fair muscular sound at apex, accentuation of aortic second sound with reduplication.

Rate, recumbent, 80, erect, 100. Blood-pressure, 100 mm. of Hg. Urine, acid, 1016, trace of albumin, no glucose. Few hyaline casts.

May 15, 1905. First bath similar to that given in Case I. Pulse, before, 90, after, 88.

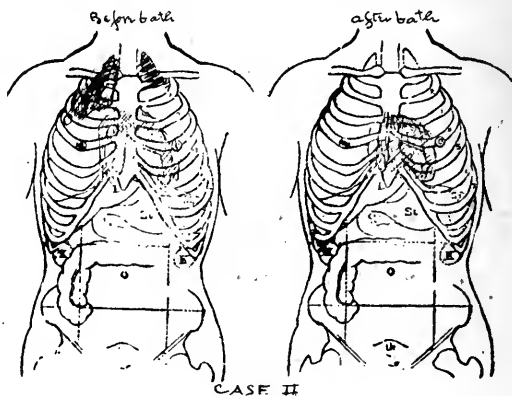
May 17. Pulse, before, 90, 10 minutes after, 88, 1 hour after, 64.

May 19. Pulse, before, 100; 10 minutes after, 82, 1 hour after, 76.

May 21. Pulse, before, 84, 10 minutes after, 76, 1 hour after, 68.

Blood-pressure, recumbent, before bath, 100 mm., after, 100 mm.

This patient was given only seven baths. At the end of this time he became disgruntled at not being allowed to go up and down three



Showing diminution of cardiac dullness.

flights of stairs daily and left the hospital without permission. During the time that the baths were given he continued to gain weight, and became less dyspneic. There was no apparent effect upon the pulmonary condition, nor could this be expected in view of the brief period of balneotherapy and the more advanced disease of the lungs. The accompanying chart shows the cardiac dullness as obtained immediately before and shortly after a bath. Similarly to Case I there was a distinct and well-marked response to the therapeutic quality of the bath, which was manifested not only by a distinct slowing of the pulse rate after the bath, but also by a wellmarked diminution in the morning and evening variation. Furthermore, the sphygmogram showed more regularity in a given series of pulse waves.

It would seem, therefore, even allowing for optimistic enthusiasm on my part, that the baths are a valuable adjunct in the treatment of pulmonary tuberculosis, for cases in which there is cardiac weakness which results from dilation. Their employment in two cases was accompanied in each instance by continued gain in weight,

with the improvement of symptoms, by a diminution in the size of the cardiac dulness, and lowering of the pulse-rate, and, to say the least, they exercise no deleterious effect upon the pulmonary condition *per se*.

## TWO CASES OF BILATERAL MALIGNANCY OF THE OVARIES.<sup>1</sup>

BY

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The onset of the disease in these two cases, representing so typically the two types of malignant tumors to be found in the ovaries, was to me, particularly striking because of the identical clinical picture presented by them as will be shown by the respective histories.

**CASE I.**—Mrs. A. B., aged 36. Family History.—No cancer nor tuberculosis. All the members of the family are living and are apparently in good health.

**Previous Medical History.**—The patient had the exanthematous diseases during childhood. No other illness. Menstrual periods were established at the age of 13 and were entirely regular. She has had three children, the oldest of whom is 12 years, the youngest 7 years. No miscarriages.

**Present illness** began two years ago (1902) with pain in the epigastric region and a distinct band sensation about the waist at this point; loss of weight and emesis forced her to stop work in September, 1904.

The report of the physical examination made by Dr. Harland Shoemaker, May 8, 1905, is as follows: Patient is markedly emaciated and the mucous membrane of the lips and eyes is very pale. The sclera are steel blue. She says she weighed 140 pounds about three years ago; now weighs 90. She vomits continually but not at any particular time. May or may not retain food some time. Saliva, if swallowed, may provoke emesis. Vomitus stains sheets a yellowish color; is very acid; no *Boas bacillus*. (Others claim to have found it.) Heart and lungs are apparently normal. Slight venous hum in vessels of neck. Liver normal. Spleen not palpable and apparently negative. Pressure over the epigastrium is painful. Abdo-

men is distended. Skin is very much atrophied, dry, and scaly. Abdominal walls are very thin—so much so that the various coils of intestines are very conspicuous. A series of vermicular movements may be seen generally running in the reverse direction. This may be created at will. The patient raises gas or a thin yellowish fluid when these movements become violent. There is no pain upon pressure except at the epigastric region. For five inches above the pubic symphysis, a hard nodular mass is felt which swings freely from side to side and springs from within the pelvis.

**Vaginal Examination.**—The cervix shows the site of an old tear but is otherwise normal. The uterus and broad ligaments are free. A nodular mass extends well down into the culdesac.

**Urine.**—No casts. No albumin. Blood.—Hemoglobin 65 percent; red blood cells, 4,270,000; white blood cells, 16,000. Differential Count.—Small mononuclears 17 percent; large mononuclears 4 percent; polymorphonuclears 77 percent; eosinophiles 1.8 percent; mast cells .2 percent. Several very large mononuclear cells were seen.

Under ether anesthesia the abdomen was opened through a median incision and these irregular nodular tumors, the right one being much the larger of the two, were easily removed by a single ligation. The broad ligaments were entirely free. There were no adhesions encountered anywhere and save for a slight thickening within the walls of the ascending colon the abdominal cavity, after the removal, seemed entirely free from disease.

There was but little peritoneal fluid present, nor had there ever been ascites.

The recovery from the operation was without any untoward symptom. The vomiting which had been so frequent throughout the day before, entirely ceased with the exception of once during the three weeks' stay at the hospital. The incision healed by primary intention, no drainage having been employed at the time of operation.

Some weeks after her return to her home, she was taken with a serous form of diarrhea which her medical attendant was unable to control, though she did not have any recurrence of vomiting. After continuing a downward course from this constant drain from the bowels, she died, I am told, October 15, 1905, from sheer exhaustion.

**Clinical Diagnosis.**—Fibrosarcoma.

The pathologic report made in the Laboratory of the University of Pennsylvania, shows the following:

<sup>1</sup> Read before the Obstetrical Society of Philadelphia, January 4, 1906.

"The section is traversed by bundles of fibrous tissue forming compartments, in which are seen numerous cells, mostly of the round-cell type, both large and small; also many spindle cells. These cells seem to be arranged into groups forming alveoli. The bloodvessels have well-formed walls and lie mostly in the fibrous tissue. Some portions of the tumor are very fibrous, while other parts consist mostly of cellular tissue.

Pathologic Diagnosis.—Alveolar sarcoma.

CASE II.—The patient was Mrs. J. R. C., aged 38, and married. She had had the best of health until November, 1904, when she was suddenly seized with severe pains in the chest and stomach, together with nausea and vomiting.

From then and until March 16, 1905, she was under the care of a physician who diagnosed the disease as pneumonia and intestinal indigestion. When Dr. Heilman, for whom I operated, first saw her (March 16, 1905) the entire right pleural cavity was filled with fluid and there was great dyspnea. He aspirated the chest and withdrew five quarts of serum. This was followed by great relief for a time but the cavity rapidly refilled. Ten days later it was again necessary to aspirate, when three quarts were withdrawn. Ten days later aspiration was again necessary. In three weeks it had again filled and the same operation was performed. After this fourth aspiration, one-half ounce of a solution of adrenalin chlorid was injected into the pleural cavity. While there was effusion after this, the cavity was never again filled up to the extent of causing marked interference with breathing. There was also a slight effusion in the left pleural cavity and pericardium.

During all this time there was some improvement in the general condition of the patient but the stomach continued troublesome all the time. Careful urinalysis failed to reveal any casts though there was a trace of albumin.

During the period recounted there was a slight effusion present in the peritoneal cavity, which, however, rapidly increased after the pleural effusion was checked. So excessive was this abdominal accumulation that tapping became necessary every ten days to two weeks.

A hard mass in the lower abdomen, observed after the early tapplings, was supposed to be thickened omentum.

On May 26, 1905, the patient was removed to Atlantic City. There was marked improvement for about a week, after which time the peritoneal effusion became so extensive as to

necessitate tapplings on July 5, 15, 25 and 31, quantities of fluid varying from two to seven quarts being removed at each operation.

On August 2, I was enabled to outline the presence of several immense masses and I decided the condition was malignant. Under ether anesthesia the masses were removed through a median incision after evacuating many quarts of straw-colored fluid well intermixed with what seemed to be peritoneal lymph. The mass to the right was quite firmly adhered to the parietal peritoneum, to the coils of intestines, and especially to the ascending colon. The entire lower half of the omentum was filled with large regular nodular masses.

The surface of the parietal peritoneum, and extending to a less extent over the visceral peritoneum, covering the intestines, was pretty liberally studded with malignant nodules. The presence of these nodules so plentifully over the serosa, together with the abundance of serous fluid, suggested the possibility of the malignancy being primarily of the peritoneum. It is not, however, possible for me to speak positively as to this.

The very general softening of the entire tumor mass, together with the extensive adhesions, made it extremely difficult to be certain that it had all been removed, though we believed it to have been.

The clinical diagnosis was—"Fibroids undergoing malignant degeneration."

The pathologic diagnosis, from the Laboratory of the University of Pennsylvania, shows the tumor to be of the adenopapilliferous type and much degenerated. Bands of connective tissue divided the tumor into loculi. These are lined by several layers of columnar epithelium and many show superimposed outgrowths of epithelium forming papillary masses. The cells are also much degenerated in portions of the tumor. Many mucoid cells are present and some show necrosis. Pathologic diagnosis—adenocarcinoma.

The numerous nodules removed from the peritoneum and the intestinal wall, as well as the masses in the omentum, also show the same changes.

The patient recovered from the operation without a single unfavorable symptom and the improvement in the general condition was at once marked and decided. At the end of three weeks she was taken to the Boardwalk on a rolling chair and everything from an operative standpoint showed complete recovery.

On August 26, while out for a sunbath on the Boardwalk, she suddenly became com-

pletely hemiplegic on the right side. The paralysis was complete over the entire right side of the body together with loss of speech. A diagnosis was made of "cerebral embolism." There was gradual but decided improvement of the paralysis for about a week when a second embolism occluded the vessels of the left leg. After this unfortunate occurrence, she sank rapidly and died without recovering consciousness on September 5, 1905.

The temperature throughout the disease was almost always normal or nearly so. The kidneys, while not always acting freely, were in a healthy state. After operation there was no return of effusion into any of the serous cavities.

Dr. Heilman further reports that during the progress of the disease, which covered a period of about a year, she had been seen in consultation at different times by three eminent physicians. He says: "We were evenly divided on the question of tuberculosis; two of us thought it was not of that character, while the others thought it was. The constant presence of some fluid in the peritoneal cavity masked the tumors to a large extent." At all events none of the skilled diagnosticians who examined her discovered them. This, I think, may be taken as evidence that their presence was not easily determined.

No examination of the blood was made.

## MEDICINES AND MEANS FOR THE CONTROL OF POSTPARTUM HEMORRHAGE.<sup>1</sup>

BY

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Although the causes of postpartum hemorrhage are numerous they produce one of three conditions, viz., uterine relaxation; extensive lacerations of the birth canal; or lack of the normal coagulability of the blood.

In *uterine relaxation*, the properties of contraction and retraction are inactive, but so long as the sensibility and irritability are not abolished they can again be induced by stimulants and irritants, whether these are administered to the system in general, externally to the abdomen, or to the uterine cavity.

<sup>1</sup>Read before the Obstetrical Society of Philadelphia, Nov. 2, 1905.

*Lacerations* require hot water locally, clamps, ligatures, sutures, or perhaps in a few select cases, packing, and in complete rupture of the uterus, laparotomy.

When due to *blood conditions* efforts must be made to produce thrombosis by hypodermics or intrauterine applications.

The possibility of a distended bladder, a loaded rectum, or the presence of pelvic abnormalities must not be overlooked, and if discovered, the woman should be relieved of the prevailing condition.

For the *control* of the hemorrhage the medicines and means employed must be directly or indirectly hemostatic in their effects. Their selection will depend to a large extent upon the cause and the local condition. The treatment may also be modified by the fact that the hemorrhage may be brought on, be accompanied or followed by shock, syncope, or anemia. Therefore, to check the hemorrhage and overcome its effects, we must (a) induce uterine contractions, (b) stimulate the various organs of the body to their respective functions, and (c) supply fluid to the heart and brain.

### DRUGS ADMINISTERED BY THE MOUTH OR SUBCUTANEOUSLY.

*Ergot*.—There is no case of labor or postpartum hemorrhage discussed unless ergot is mentioned either to be severely condemned or highly lauded. Many are opposed to its use as a preventive of hemorrhage, claiming that much harm is done by the severe contractions, which prevent the free elimination of the uterine secretions and thereby favor the absorption of infected substances. Others favor its use, not only to prevent hemorrhage by the firm uterine contractions but also the free accumulation of blood and clots within the cavity. I make it a rule in all cases of labor, to give one or two half-dram doses of ergotole after the uterus is empty. I have seen no ill-effects and am convinced that much good has resulted. The fluid extract of ergot can be used in the same manner. Ergotin may be given.

As a contractor of uterine muscles, ergot has no rival and consequently it is one of the most

useful drugs for the control of postpartum hemorrhage. It not only stimulates all the uterine muscles (and especially the circular fibers) but also the arterial musculature and by this double action causes the dangerous bleeding to cease. It affects both the corpus and cervix uteri. Some claim that it acts directly upon the uterine fibers while others are of the opinion that these respond to the spinal irritation produced by the drug. By its tonic action upon the heart and the bloodvessels the circulation is equalized throughout the system and on this account it is considered of value in shock. Many, however, think ergot contraindicated for shock as they do all stimulants.

In alarming and dangerous forms of postpartum hemorrhage, I give aseptic ergot hypodermically. Its effects can be noticed almost immediately. On two occasions only did it seem ineffectual, and in one of these cases, it appeared to have an unfavorable effect upon the heart, nevertheless, it has been of such great service to me that I would not feel secure without its administration. Let me emphasize that I never use it in any form or manner until I am convinced that no fragments of the placenta or membranes are retained in the uterus.

*Strychnin.*—In a very large number of cases, strychnin is of as much value as ergot, and in some cases of exhaustion and inertia, it is of even greater value. It is best in all cases to administer it hypodermically in doses of 1.6, 2 or 3 mg. ( $\frac{1}{40}$ ,  $\frac{1}{30}$  or  $\frac{1}{20}$  gr.) and repeated whenever indicated by the condition of the pulse and the uterus. It can be given in conjunction with ergot or digitalis and is a splendid drug to combine with morphin when the latter is required for cerebral anemia and restlessness. Strychnin acts upon the nervous system and through it becomes a uterine, as well as a cardiac and vascular stimulant. Some claim that it is the medicine for shock and others again condemn it. Whenever strychnin is given watch for idiosyncrasies and remember also that overstimulation will result in a reaction and in the condition you are trying to prevent.

*Digitalis.*—Whenever digitalis is given for postpartum hemorrhage, it should be injected

subcutaneously in order to obtain quick results. It is well to combine it with strychnin, since the latter acts quicker but the digitalis will continue longer in its effects. It lessens the heart-beats, contracts the bloodvessels, and some claim that it acts also directly upon the uterine muscles. It may act upon the uterus, it does act upon the bloodvessels in the uterus and thus is a valuable drug in bleeding after labor, it also allows more blood to go to the heart during the diastole. Digitalis can also be given with ergot. It is very useful in shock and syncope. The dose of digitalis hypodermically is 0.6 to 2 cc. (10 to 30 minims), of digitalin 0.6 mg. to 1 mg. ( $\frac{1}{100}$  to  $\frac{1}{50}$  gr.). Digitalin I have used with beautiful effect upon the pulse, general condition of the patient, and apparently upon the hemorrhage.

*Adrenalin Chlorid.*—This is a powerful hemostatic, it is a cardiac stimulant, arrests the hemorrhage by its action on the uterine muscle, and is a local styptic. It is a good drug to use when the hemorrhage is not too severe or as a preventive of secondary postpartum hemorrhage when this is feared. The 1:1,000 solution can be given by the mouth in doses of 0.3 to 0.6 cc. (5 to 10 minims) or even more, every 15 or 30 minutes, if necessary. It is of value when given hypodermically in normal salt solution, or intravenously in the same manner, in the strength of 1:10,000 (*i.e.*, one part of the 1:1,000 solution of the adrenalin chlorid to ten parts of the normal saline solution). It is the very best drug for shock. I have never used adrenalin chlorid in cases of hemorrhage in labor but I should certainly make use of it in these cases when shock was present.

*Calcium Chlorid and Gelatin.*—Calcium chlorid produces coagulability of the blood. It is usually administered through the medium of gelatin which contains about 0.6 percent of it. A great deal of the commercial gelatin is said to contain certain albumoses which prevent hemostatic action. The gelatin can be given into a cleansed bowel in the quantity of 50 cc. of the 2 percent solution in normal saline solution as a medium with a few drops of laudanum. The effects are said to be pro-

duced in about ten minutes. Pure sterile gelatin can be given intravenously in from 1 to 3 gm. (15 to 45 gr.). It is said to be the only styptic that should be used in the uterine cavity. Whether it would be of value in severe postpartum hemorrhage I cannot tell and would like to know whether any of my readers have ever tried it.

**Stimulants.**—Those of real value, strychnin and digitalis, have been mentioned. Nitroglycerin is used by some but I can see no indications for it unless syncope and shock follow the hemorrhage. Caffein citrate being a cardiac and cerebral stimulant is useful only when syncope follows. Strophanthus does not contract bloodvessels as does digitalis, therefore is not indicated. Alcohol (whisky or brandy) can be of no use in marked cases of hemorrhage and on account of its secondary effects is positively contraindicated—do not give it in shock. Ether may be given hypodermically for a flagging heart. The ammonium carbonate is excellent by the bowel when shock accompanies the hemorrhage. Camphor is a diffusible stimulant and a dilator of bloodvessels—do not give it in these cases. The tincture of musk has been recommended but better agents exist. Do not give quinin, although it is an oxytocic, it has a depressing effect and it has been blamed for hemorrhages. Turpentine has been recommended for bleeding due to purpura hæmorrhagica and hemophilia.

**Atropin.**—Although atropin has a relaxing effect upon the uterus in cases of dysmenorrhea, yet, it does nicely in postpartum hemorrhage, since it acts through the nervous system as a stimulant to the heart, the circulation, the respiration, the brain, and the heart centers. It is invaluable when shock follows the hemorrhage and can be combined with morphin in such instances.

**Morphin.**—This is excellent in shock, when given in conjunction with strychnin and atropin. It is especially indicated when the hemorrhage is so profuse as to cause marked cerebral anemia, for in this condition the patient becomes very restless. Morphin quiets the patient, the heart is given more rest and in a very short

time the brain is quieted and sleep comes on because more blood is sent to the head; 0.01 to 0.02 gm. ( $\frac{1}{8}$  to  $\frac{1}{4}$  grains) can be injected. It may be called a hemostatic on account of its sedative action upon the uterus and the circulatory system.

**Normal Salt Solution.**—In every case of excessive bleeding, this fluid should be supplied to the system. Death does not occur simply because blood has been lost but rather that a certain quantity of fluid is lacking for the heart and the vessels to react upon. The solution can be given by the bowel (the most convenient method and very effectual), or under the skin (into the breast, thighs, etc.), or, best of all into the veins. This gives volume to the circulation and acts as a mechanical stimulant. It should be given in all cases of collapse, shock and anemia following postpartum hemorrhage. The quantity injected into the veins may vary from one to three pints, according to the amount of blood lost and the condition of the patient.

#### MEASURES EMPLOYED EXTERNALLY.

**Massage and Compression of the Uterus.**—As a prophylactic and therapeutic measure in postpartum hemorrhage there is none equal to this for several reasons: It is usually the most effectual especially as a preventive, it is an external method and therefore free from the dangers of infection, and the manipulating hand is able to note the exact state of the uterus. After the placenta has been delivered, whether naturally or by Credé's method the hand of the accoucheur should remain upon the fundus of the uterus for a half hour or hour. The manipulations should be gentle and light in most instances. In this manner, hemorrhage is prevented in many cases, otherwise the hand is at once able to detect the relaxation and flabbiness of the uterus and no concealed postpartum hemorrhage can occur without the attendant's knowledge.

Whenever hemorrhage occurs, the first thing to do is to knead the uterus and if a nurse is in attendance she can prepare the necessary hypodermics and inject them. The uterine

manipulations are of first importance, the hypodermics are secondary; in some instances both are equally imperative.

Whenever the external massage and the hypodermics do not obtain response then hot water intrauterine irrigations should be added.

In a few instances only is it necessary to introduce the hand into the vagina for bimanual compression, which is a very effectual method in extreme cases.

*Compression of the Abdominal Aorta.*—This by many is considered the ideal method of checking postpartum hemorrhage, since, as they claim, it is free from the dangers of infection, prevents the blood from coming to the uterus, sending it to the heart and brain, and affords time for the preparation of other and more lasting measures. The advocates of this treatment advise the pressure to be made between the abdominal recti muscles on the aorta, above the umbilicus and the uterine blood supply, and press it against the vertebrae until the pulsation ceases. When the pressure is released, and it may be a long time before this is allowable, it must be done gradually so as to prevent a rush of the blood to the uterus and dislodge the clots that may have formed. Some claim that it is not the cutting off of the blood that checks the bleeding, since the vena cava is also pressed upon, but the hypogastric plexus being irritated causes contraction of the uterine muscles. This method no doubt has done good but I have never received satisfactory results and have abandoned its application.

*Posture of Patient.*—It is of great assistance to lower the patient's head (removing pillows, etc.) and to elevate the hips and lower limbs by raising the foot of the bed as much as possible, but remember that a slight elevation will do no good. In this manner the heart will have its full supply of fluid and the cerebral anemia will be relieved.

*Ice to the Abdomen.*—This is a wonderful agent in postpartum hemorrhage when applied externally over the uterus. I use it frequently whenever there is a tendency to uterine relaxation and free bleeding, since it relieves the administration of drugs and local applications.

It is harmless unless it should chill the patient too much.

*Fritch's "Rational Bandage."*—This is an old method but it is claimed that it is more effectual than either aortic compression or bandaging of the legs. The uterine cavity should be free of clots, the hand is pressed down between the recti muscles and the fundus uteri raised so as to bend it forward and over the symphysis pubic bone, then the abdominal wall is pushed down and behind the ante-flexed uterus, the depression is packed with pads or towels, the uterus is then fixed in this position by bandages which also press the padding deeper toward the pelvic inlet. In this way the uterine cavity is obliterated, the hemostasis is immediate, no internal manipulations are necessary, and the compresses being once fixed nothing needs be done for 12 or 24 hours. I have never tried this method.

*Bandaging of the Limbs.*—This is also called "autotransfusion" and consists of firm bandaging of the legs and arms. It is resorted to after severe hemorrhage rather than for the hemorrhage itself. It brings the blood to the heart and brain and is useful when syncope, shock, or anemia have resulted from the flooding. Care must be taken not to injure the extremities and the bandages should be removed slowly. Venaclysis is a far superior method in every way.

*The Abdominal Binder.*—Briefly, I will say that this is a great preventive of postpartum hemorrhage—primary or secondary. A pad should be placed above and in front of the fundus uteri and not below it or the results may be disastrous.

*Flagellation of the Abdomen.*—This is an old-time method and in some cases did good. It is, however, a hazardous procedure in cases of shock and should not be tried.

*Heat to the Body and Extremities.*—Whenever shock is present this is of benefit.

*Nursing.*—This stimulates to uterine contractions but in severe cases it would be useless. It can be tried when the hemorrhage is under control if the patient is not too much exhausted.

*Inhalations.*—Fresh air would naturally be suggested to the attendant by the patient's

condition of syncope, or of "air-hunger" which occurs in severe cases. Oxygen is of value, especially in cases of shock. Inhalations of camphor or ammonia may be helpful when syncope has come on.

#### DRUGS AND MEANS EMPLOYED WITHIN THE UTERUS.

*Hot Water Irrigations.*—Whenever uterine massage and hypodermics of ergot and strychnin fail these should be employed. The water should be 115° F. to 120° F.; it can be readily used at this temperature when the patient is under an anesthetic, not so well otherwise, since it burns the patient when it runs over the external parts. Yet, it must be remembered that unless the water is *hot*, say 115° F., it will not act sufficiently as a styptic, which is absolutely necessary to check the bleeding and cause contractions of the uterus by its action upon the fibers and the arterioles of the uterus. If there is time add mild antiseptics. Hot water acts promptly, is aseptic and cleansing. It is better than ice, and safer. When intrauterine injections are given care must be taken that the nozzle of the douche apparatus contains no air.

*Intrauterine Manipulations.*—Frequently in hemorrhage the cause is retained or adherent placenta, as a whole or in part, or retained blood clots. In such an instance the offending material must be removed at once. In concealed postpartum hemorrhage this is always necessary. If possible have the hand thoroughly sterilized but if the case is too desperate the hand must be passed into the cavity without this precaution.

The introduced hand is good, not only for the cleansing of the uterine cavity, but it acts also as a local irritant and foreign body, thus inciting to contractions and the cessation of the bleeding. For various reasons, a hand should not be introduced unless the conditions are very serious, but I have noticed that there may be no response until a hand is within the cavity accompanied by hot irrigations. This bimanual hold upon the uterus is not only effectual in the manner described but enables the accoucheur to note fully the indications for other measures.

*Vinegar.*—Vinegar and lemon juice have

strong advocates. I have never used either one. Vinegar is not aseptic. It is, however, very effectual and when nothing better is at hand it may be employed. It is a chemical irritant and local styptic. It may be injected into the uterine cavity or carried in on a saturated cloth and by squeezing cause it to run over the intrauterine surface.

*Ice within the Uterus.*—In cases in which hot water fails, ice may produce an immediate effect. It is a powerful hemostatic. It is not aseptic and tetanus is reported to have followed its use. I have never employed it in the birth canal.

*Astringent Acids.*—These are now condemned. Perhaps they are allowable in purpura hæmorrhagica or hemophilia.

*Iodin.*—This has been recommended but cleaner and more reliable measures are usually more readily at one's command.

*Iron.*—This drug in the form of Monsell's solution was in former times used extensively to produce thrombosis within the uterus in postpartum hemorrhage.

This, however, is an exceedingly unclean method, very severe in its action upon the uterine lining, the formed clots are liable to be dislodged and favor secondary hemorrhage, and it is almost certain to lead to infection. It should not be employed.

*Tampons.*—Formerly tampons were frequently employed. Dührssen seems to have advocated their use quite recently.

It is very difficult to pack the uterine cavity effectually, in fact quite impossible in severe cases in which the uterus is very flabby; and if the packing were sufficiently tight to check the bleeding in such a largely distended uterus, it appears to me the desired uterine contractions would most likely be prevented.

The packing becomes saturated with blood and the bleeding may continue to a fatal issue. Air may be introduced while tamponing with the gauze. Considerable time is required to pack. Sepsis is very common when plugging is done. There is danger of secondary hemorrhage when the gauze is removed. In extensive tears of the cervix, it is a dangerous pro-

cedure since concealed postpartum hemorrhage may occur. Personally, I would not resort to packing unless other means failed to check the hemorrhage.

#### OPERATIONS.

In cases of severe hemorrhage during the second stage of labor, version, forceps, cesarean section, or craniotomy may be necessary; fortunately this is seldom the case. After delivery, displacements of various kinds may have to be corrected. Lacerations of the birth canal must be repaired. If cervical tears are too severe clamps may be needed for some time. One writer recently spoke of applying clamps to the parametrium on the right and left sides—this is no doubt a dangerous method. Laparotomy is required in complete rupture of the uterus. Curetment may be necessary in cases of hydatidiform moles, placental fragments and syncytioma.

In conclusion I would say that it may not be an easy matter to control hemorrhage after delivery but it can be done by very simple methods, in fact the more ordinary and simple the agencies the better, for then the poverty stricken patient can be saved as readily as the wealthy. Act without delay, resort to no unnecessary measures. Remember that anything overdone will result in failure. I believe that nearly all cases can be successfully handled by uterine massage, hypodermics of ergot and strychnin, and hot water intrauterine irrigations. It is best not to enter the uterus if it can be avoided.

### THROMBOSIS OF THE SUPERIOR MESEN- TERIC ARTERY WITH HEMORRHAGIC INFARCTION AND PERFORATION OF THE ILEUM.<sup>1</sup>

BY

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lege Hospital.)

This paper is based upon the results of an autopsy in which, among other lesions, a purulent inflammation of the peritoneum consecutive

to a perforation of the ileum was found. The clinical diagnosis of the case was intestinal obstruction.

The right iliac fossa contained 30 cc. of greyish-yellow purulent fluid and considerable intestinal contents; the peritoneum in this area was reddened at points, at other places it was covered with masses of fibrin agglutinating the coils of the intestines. The condition, while most advanced in the area named, also extended toward the other side and into the pelvis. As the coils of intestine were separated, about one meter from the ileocecal valve a small irregular opening was found in the ileum from which the intestinal contents oozed. When the intestines were opened the area in which the perforation had taken place did not contain a Peyer's patch. Its long axis ran transversely to the long axis of the bowel. The margin of the area was elevated, reddened, denser than the surrounding structure and appeared undermined. The ulcer was oval in outline, the floor red and ragged; the perforation occurred near the center; its margin was irregular, fragmented and measured 0.5 by 1 cm. in diameter. At a point 10 cm. toward the ileocecal valve was another ulcer which apparently had been formed by coalescence of two smaller necrotic areas; the ulcer measured 2 by 3 cm. In structure it was similar to the other except there was no perforation. The mucosa of the ileum was slightly thickened, edematous and covered with tenacious mucoid substance. The solitary and aggregated follicles were moderately swollen. The duodenum and jejunum presented nothing noteworthy, but the catarrhal condition of the mucosa of the colon was pronounced.

The heart showed a moderate amount of fibroid degeneration but the valve leaflets were little altered.

The bronchi contained fecal matter; there was no evidence of a beginning pneumonia.

The larger vessels were moderately sclerotic; the superior mesenteric artery contained neither a thrombus nor an embolus nor was it in any way diseased so far as could be determined with the naked eye. Unfortunately the portal vein was not examined so that thrombosis of that structure cannot be excluded, although the mesenteric vein and branches of the portal vein were not distended. The inferior mesenteric artery was not opened, since, because of its distribution, it is not likely that the infarcts could have resulted from an embolus or a thrombus of that structure.

Histologically the mucosa of the sections made from one of the ulcers described is greatly

<sup>1</sup> Read at the meeting of the Philadelphia Pathological Society, May 25, 1905.

altered; the floor of the ulcer is made up of necrotic material which contains many cells, principally leukocytes, red blood cells, and fibrin. Near the viable tissue but still in the necrotic mass there is an abundant infiltration of blood. This hemorrhage is not confined to the necrotic tissue but is also found in the submucosa, serosa and to a certain extent in the musculature. The submucosa contains many bloodvessels which are thrombosed and in the thrombi are many endothelial cells. The mucosa forming the margin of the ulcer is necrotic at points, the condition being most marked between the valvulae conniventes especially where the tips of these structures lie in contact forming an enclosure which is poorly drained. The necrosis in these areas involves nearly the whole mucosa. The epithelium of the crypts near the surface of the mucosa is necrotic while those cells in the deeper portion of the tubules are as a rule fairly well preserved. The interstitial tissue is abundantly infiltrated with formative cells including a few leukocytes; there is also present some newly formed fibrous tissue. The interstitial inflammation is evidently older and in all probability existed for some time before the ulcers were formed. Occasionally extravasations of blood are found in this part of the mucosa but are more abundant in the submucosa, which structure is involved to a greater extent than the remaining coats.

*Anatomic Diagnosis.*—Chronic adherent pleurisy; chronic myocarditis; chronic interstitial nephritis; chronic catarrhal ileocolitis; acute purulent peritonitis with perforation of intestine; hemorrhagic infarction of the ileum.

In regard to the etiologic factors in thrombosis and embolism of the superior mesenteric artery, a study of the recorded observations shows that arteriosclerosis is present in most cases and that endocarditis is the next frequent accompanying lesion. Virchow<sup>1</sup> found at autopsy, vegetations on the tricuspid valves, a thrombus in the left auricle, stenosis of the mitral and vegetation on the aortic leaflets. The case observed by Kaufmann<sup>2</sup> and the one recorded by Scott<sup>3</sup> showed thrombosis of the left auricle. Reitter<sup>4</sup> reported a case in which mitral stenosis and regurgitation were present. Similar cases are recorded by Osler,<sup>5</sup> and also by Claisse and Abrami.<sup>6</sup> Beckmann<sup>7</sup> found calcareous patches in the aorta and he believed the embolus in the superior mesenteric artery was a detached fragment of the vessel wall. Kussmann's<sup>8</sup> case

showed an acute endocarditis of the mitral valve and infarction of both kidneys. Deckart records a similar case. In Oppolzer's<sup>9</sup> case mitral stenosis in which the surface of the valves were smooth, atheroma of the aorta and hemorrhagic gastric erosions consecutive to gastric catarrh, were found. He is inclined to believe that the clot in the superior mesenteric artery arose from a thrombus in the heart, although upon this point there is no conclusive evidence. Faber,<sup>10</sup> in one of his cases, holds the endocarditis responsible for the embolus; the second he attributes to an aortic thrombus, while in the third he is somewhat in doubt as to whether the thrombus in the left ventricle or the endocarditis should be incriminated; in the fourth case the cause could not be determined. E. Grawitz<sup>11</sup> observed in one of his cases a chronic interstitial nephritis, hypertrophy and dilation of the heart, a dissecting aneurysm of the aorta, atheroma of the larger vessels, infarction of the spleen, circumscribed peritonitis, catarrhal pneumonia, and cerebral apoplexy. He believes all the conditions present can be traced to the changes in the kidneys which first induced the alterations in the heart, these in turn gave rise to the atheroma which was responsible for the emboli. In another case he attributes the condition to changes in the spleen incident to malaria.

The cause of the thrombosis in the two cases reported by Moyes<sup>12</sup> was disease of the mitral valve, upon which, in each case, he found a roughened area. Foulis<sup>13</sup> reported a similar case. Bradford<sup>14</sup> attributed the thrombus in the superior mesenteric vein to disease of the mesenteric lymph-nodes for which disease he could find no cause. The valve leaflets of the aorta and the branches of this vessel were normal in Litten's<sup>15</sup> case and there was no thrombus in the cavities of the heart; the mesenteric artery was occluded by a thrombus which he attributes to a circumscribed endarteritis. Lorenz<sup>16</sup> reports a case which presented a condition very much like the last. A similar case was recorded by Firket and Malvoz,<sup>17</sup> but Nothnagel<sup>18</sup> maintains that in this case it cannot be settled beyond doubt that the thrombus was spontaneous, since in addition to the atheroma of the mesenteric

vessels there was a widespread atheroma of the aorta and endocardium. In Nothnagel's case there were capillary emboli in the arteries of the intestinal wall. The emboli were consecutive to a pulmonary abscess. This patient had been in the habit of injecting morphin into his arm for years; the skin was covered with ulcers and the axillary lymph-nodes were suppurating; the patient died with symptoms of pyemia. Mall<sup>19</sup> states that when the splanchnic nerves are irritated the mesenteric vessels contract. Pillit<sup>20</sup> has been struck by the obesity of his two patients and suggests that possibly this condition is instrumental in bringing about venous stasis. He holds that the thrombosis is ascending, comes from the intestines and is of an infectious or toxic nature. It is difficult, he notes, to establish that the microorganisms found in the glands are primarily the cause of the affection for they may have developed on the gangrenous mucosa after the thrombosis. In Cramer's<sup>21</sup> case, the occlusion of the artery occurred 11 days after confinement. Although no clinical data point to the existence of a puerperal septic endocarditis and since no autopsy was obtained, he suggests that during the puerperium, the endocarditis may have instituted a warty-like growth on the valves instead of an ulcerative process, and produced no symptoms. He carries his speculation a step further and supposes that the embolus arose from a venous thrombosis during the puerperium, but instead of passing through the pulmonary circulation entered the left auricle through the foramen ovale. As causes of thrombosis or embolism of the superior mesenteric artery Welch<sup>22</sup> mentions thrombus in the left heart, atheroma or aneurysm of the aorta, thrombus in the pulmonary veins caused by gangrene of the lung.

The cause of the hemorrhagic infarction in the case reported in this paper is evidently obscure, since there was no heart lesion and the arteriosclerosis appeared insufficient to explain the phenomena. Yet from the character of the lesion found, one would not suspect a thrombus or an embolus in the trunk nor even in the larger branches of the artery. From the histologic picture I am inclined to think that the

catarrhal inflammation which had been present for some time instituted the evident thrombosis of the finer branches.

Schlosser<sup>23</sup> by experimental investigation, found that if the mesenteric vessels were divided at a point less than 2 cm. from the intestinal wall ulceration did not occur, but if the division were at a point more than 5 cm. from the intestinal wall perforation and fatal peritonitis ensued, and if the division were between these two points ulceration always occurred, which, however, healed and produced a stricture.

The extent of the lesion resulting from the obstructing of the superior mesenteric artery depends entirely upon the site of the occlusion. If, as observed by Virchow, Beckmann, Taydor,<sup>24</sup> Moyes, Kussmann, Oppolzer, Eisenlohr,<sup>25</sup> Claisse and Abrami, Kaufmann, Deckart,<sup>26</sup> Gordon,<sup>27</sup> Munro,<sup>28</sup> Cramer, Conti,<sup>29</sup> Cattani,<sup>30</sup> Councilman,<sup>31</sup> and also Leclere and Beutter<sup>32</sup> the occluding body is in the main trunk of the superior mesenteric artery, the mucosa of the lower portion of the duodenum, the whole jejunum, ileum and ascending colon are swollen, red, or reddish-black and brittle. Occasionally a portion of the mucosa is separated and necrotic. In many instances, the lumen of the intestine contains considerable blood. Hemorrhage is occasionally seen in the mesentery. The presence of hemorrhagic infarction followed by ulceration has been noted by Councilman, Reitter, Lohr,<sup>33</sup> Parenski,<sup>34</sup> Lorenz, and also Firket and Malvoz. Conti observed a case terminating in perforation of the transverse colon followed by general peritonitis. Kaufmann also noted a perforation in one case but believes it was artificial. Watson,<sup>35</sup> Pieper,<sup>36</sup> Ponfick,<sup>37</sup> Elliott,<sup>38</sup> and Lothrop<sup>39</sup> report cases of embolism of the superior mesenteric artery with general peritonitis, but no perforation; Howse<sup>40</sup> records one case in which fistulous communication existed between the coils of the intestine.

Finlayson,<sup>41</sup> Moos,<sup>42</sup> Cohen,<sup>43</sup> Karcher,<sup>44</sup> Virchow and Chiene<sup>45</sup> report cases of embolism of the superior mesenteric artery in which the patients recovered.

Considerable experimental work as been done

with the view of determining the route by which the blood reaches the interstitial structure of the intestinal wall after the occlusion of the artery. Deckart attributes to Cohnheim the statement that infarction of the mucosa of the intestine does not occur unless there are emboli or thrombi in the smaller branches of the mesentery artery as well as in the trunk or in the larger branches. Litten<sup>46</sup> found when the artery of an animal was ligated, hemorrhagic and suppurative peritonitis developed and the mesenteric lymph-nodes and Peyer's patches became swollen. The lower portion of the duodenum, the jejunum, the ileum and the ascending colon were reddened and the mucosa edematous. If a comparatively large branch were ligated hemorrhagic infarction developed. He ligated the trunk of the superior mesenteric artery and observed the changes in the intestine until death of the animal ensued. The wound of the abdomen was closed with clamps so that he could at any time draw out the intestines. The intestines at first became pale, nodular and contracted; the arteries collapsed and the veins became distended. Soon the intestine relaxed and became dilated. Since the circulation was not reestablished, he declares that the influx of blood must be, as pointed out by Cohnheim, through venous regurgitation. By experimental observation Litten determined that the walls of the capillaries and the small veins undergo necrosis in from two to two and one-half hours after the circulation ceases. He then found that when the superior mesenteric artery is ligated and an indigo solution is injected into the jugular vein, the area supplied by the occluded artery remains uncolored while the rest of the body is tinged blue. The same results are obtained if the solution is injected into the left heart. He concludes from his experiments that the superior mesenteric artery is functionally an end artery. Contrary to the views expressed by Litten, Cohen holds that venous regurgitation is not responsible for the hemorrhagic infarction, but that the blood is brought to the parts by the collateral circulation; when the mesenteric vein is ligated the area becomes infiltrated with more blood than if the artery alone had been

occluded. Cohen's view is contradicted by Faber, who maintains that the vascular area of the superior mesenteric artery is too large, the inferior mesenteric cannot furnish enough blood to raise the pressure in the affected part to any appreciable degree. Then, too, the escape of the blood from the inferior artery into the veins is easier than its escape into the superior mesenteric artery. Therefore, he believes, that after occlusion of the superior mesenteric artery the pressure within the vessel falls to zero, and since it is positive in the portal vein, regurgitation occurs. By ligating the left renal vein and the superior mesenteric artery in animals, he produced lesions similar to those seen in man after occlusion of the artery. He then ligated the superior mesenteric artery and the branch of the portal vein that enters the left lobe of the liver. Five hours after the operation he killed the animal and found the lower portion of the duodenum, the jejunum and part of the ileum injected, but not the lower fourth of the small intestines. Mall<sup>47</sup> tells us that immediately after the closure of the main trunk of the superior mesenteric artery the intestines of the animal experimented upon are thrown into violent contraction; they remain anemic and contracted for two or three hours, when the spasm relaxes and the ischemia gives way to venous engorgement and infarction. The intestinal contraction, which, under the circumstances, is equivalent to the arterial spasm, is probably one, although not the sole reason why, in spite of the free anastomosis, occlusion of the artery supplying the intestine is followed by necrosis and infarction. Hemmeter<sup>48</sup> maintains that the whole vascular area of the superior mesenteric artery can be injected from the aorta after the main trunk has been ligated, but in the living human being and in animals the different conditions of pressure control the distribution of the circulating blood. The reduction of the pressure to zero when the blood supplied is cut off cannot be raised by the inflowing blood from the inferior mesenteric artery, for the amount is too small. Although infarction occurred after Cohen ligated the mesenteric vein, I am inclined to think the anastomosis of the veins

is even greater than that of the arteries, so that the blood from the portal vein with a positive pressure will find its way into the anemic area even though the mesenteric vein be ligated.

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## CONGENITAL FETAL MALFORMATIONS WITH EXHIBITION OF A SPECIMEN.<sup>1</sup>

BY

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It may well be a matter of wonder that vices of fetal development do not oftener occur. This seems especially so when we contemplate the multitudinous cells of the human embryo, their multiplication, their transformations, their rearrangement, grouping, outgrowths, and ingrowths into organs so diverse in functions; so, also, when we consider the infinite number and variety of impressions, mental and physical, to which the pregnant woman is daily subjected and to which she is so particularly susceptible.

Puesch found in 100,000 births 454 simple malformations, 61 single monstrosities and two double monstrosities; or one child with more or less abnormal development in 200 or fewer births. This estimate, perhaps, does not take into account the fact that many minor abnormalities occur in the deeper tissues or internal organs and are never detected. Lesser anomalies are exceedingly common in the dissecting room, most of them never suspected during life.

As to the cause of abnormalities of development, perhaps the oldest theory is that of maternal psychic impressions or supernatural causes, thus veiling the matter in much superstition. Belief in such causation can be definitely traced to the centuries preceding the Christian era. The Greeks, particularly, felt the necessity of surrounding the pregnant woman with environments of comfort and beauty. Belief in hereditary and supernatural causes, possibly in mater-

<sup>1</sup> Read before the Obstetrical Society of Philadelphia, October 5, 1905.

nal impressions as well, is directly reflected in the question concerning the congenitally blind man, "Did this man sin or his parents?" and also in, "The sins of the parents are visited upon the children to the third and fourth generation." We scout the supernatural as superstitious, and partially discredit the theory of maternal impressions, and yet some scientific facts remain unexplained without the admission of the latter. Puesch found abnormalities more frequent in illegitimate than in legitimate children. Statistics of births during the siege of Paris in 1870-71 show the undoubted effect of profound shock, destitution, and want. Of 92 children born at the time, 64 had slight mental or physical abnormalities, 20 were weak minded and 8 are said to have been moral imbeciles. Doubtful believers and even disbelievers in the causative effect of maternal impressions think it wise that a pregnant woman avoid violent emotions, unpleasant sights and sounds, and all things "outside the proprieties of life."

The investigations of Ballantyne have thrown much light upon this subject of embryology. He classes the causes of monstrosities as follows: 1. Mechanical. Mechanical disturbance of eggs has served to produce all manner of monstrosities in lower animal life. 2. Diseases of the fetus and fetal adnexa. 3. Embryologic and germinal states, such as heredity and atavism, environment, and germ infection.

The fetal specimen which I wish to exhibit belongs to the class of malformations known as hemiterata, the class including all human beings having any abnormality of development not grave enough to be called monstrous, nor yet belonging to the classes heterotoxic or hermaphroditic. A few important points in the history of the case, both maternal and fetal, are of interest.

The mother, Mrs. V. F., was first seen by me when in labor, in consultation with Dr. M. F. Sewell, to whom the patient had been referred by Dr. F. L. Greenwalt during the latter's absence from the city. The mother, aged 24, had given birth to two healthy children aged two and about one year respectively, the pregnancies thus being in rapid succession. In the second pregnancy there was an excess of amniotic fluid.

During the recent pregnancy no abnormalities were observed except, perhaps, excessive thirst and undue enlargement of the abdomen.

Labor was delayed, apparently because of the excessive distention of the abdomen, but after manual rupture of the membranes, followed by the discharge of a large quantity of amniotic fluid, perhaps four quarts, the fetus was in a few minutes spontaneously expelled. The child was believed to be well formed, although the face looked peculiarly flat and the anteroposterior dimensions of the head short; the latter was believed to have been due to a lack of molding because of the large size of the birth canal. For the first 24 hours the child was apparently healthy, but then began to regurgitate all things administered by mouth, and later frequently vomited much dark green liquid, similar to that commonly seen in intestinal obstruction in adults. Slight abdominal distention ensued.

Efforts made by laxatives by mouth and by high enemas to secure a passage of the bowel were ineffective. The child died of exhaustion at the end of 72 hours.

The probable diagnosis of intestinal obstruction was confirmed by the pathologic findings at autopsy. The specimen consists of the stomach, which is seemingly normal except for distention, probably occurring postnatal, and a portion of the duodenum. The latter, for one and a half inches beyond the pylorus, has also been distended enormously. Below this portion, the gut for two inches is replaced by a small impervious fibrous cord. Below the latter, for a short distance, the intestine is abnormally small but patulous, thence shading into a normally formed gut.

The presence of hydramnios is an important feature of the case and raises the interesting question as to whether the abnormality and the hydramnios are related as cause and effect or are only concomitant. In something less than one-half the cases of hydramnios some abnormality of the fetus is found to exist. Some of the more common malformations are hare-lip, club-foot and spina bifida. Hydramnios may occur as the result of some pathologic condition of the mother, of the fetal adnexa, especially of the amnion, but more often of the fetus itself, such as some obstruction of the fetal circulation, especially that of the umbilical or other veins, carrying maternal blood to the fetal heart.

Blood-pressure may be raised by a lesion of the fetal heart, by a tumor in the fetus obstruct-

ing the circulation, or by an abnormal condition of the cord, *e.g.*, a marked torsion, with a resulting excessive transudate of amniotic fluid.

It is to be regretted that in this case careful study was not made to determine whether there was not obstruction of the ductus venosus or of the portal vein, for the lesion of the gut in this region suggests the great probability of stenosis of these vessels.

Malformations of the intestine are not very common, but of the varieties, atresia of the anus or of the rectum are most frequent. These may consist of an imperforate anus, of a membranous septum across the lumen of the rectum, or the rectum may terminate some distance from the anus in a blind pouch, being represented below by a fibrous cord. Aside from malformations of the anus and rectum, those of the small bowel are most common, and of the latter, those of the duodenum are the most frequent. Such is this specimen. The abnormality is generally atresia or stenosis, the former being most often seen. The chief causes assigned for such conditions are fetal peritonitis and volvulus.

A few thoughts worthy of consideration because perhaps of practical value and utility seem suggested by the previous presentation: 1. The probable futility of any surgical intervention in this and similar cases, although it would be advisable to try it, if positive diagnosis can be made. 2. The complications of parturition incident to hydramnios 3. The frequency of association of hydramnios and fetal abnormalities. 4. The obscurity of the etiology of hydramnios and the desirability of careful search for pathologic lesions as causes. 5. As valuable knowledge is often to be acquired by postmortem study of the fetus, whatever may have been the apparent cause of death, such study should always be made, if possible.

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## SEVEN YEARS WITH HOME TREATMENT OF TUBERCULOSIS IN PRIVATE PRACTICE.

BY

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In looking over my records in the treatment of tuberculosis in the pulmonary form, it gives me pleasure to state that my results in treating this disease have met some degree of success in a considerable number of cases, in a New England climate. No one need doubt that the results obtained in previous years in private practice and charitable institutions have not been all that could be desired.

Our Massachusetts Legislature has in times past been generous in its appropriations to its sanatoriums, and not without obtaining a great deal of good in return, far more so than in some States. In this respect we are not in a position to complain. The difficulties which stood in the way of those in charge of the institutions, however, have been many, and a great deal of praise and credit is due our great and generous physicians whose time and best efforts have been at the disposal of the State and its sick. From time to time the methods of our institutions have been subjected to severe criticism, often, no doubt, with the best intentions, from those whom I believe have not fully understood the precise use and indication of these places.

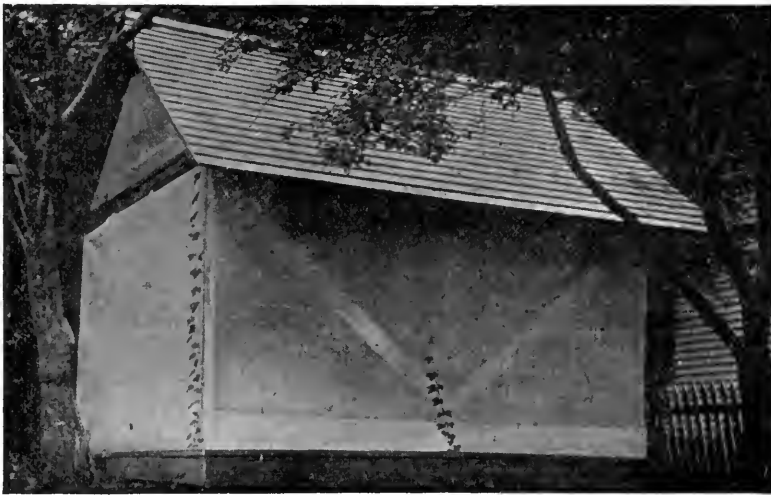
I think it should be understood, however, that advanced cases are not the proper kind to admit and the failure to accept many such cases has been the frequent cause of adverse criticism, not only from the laity, but from our own profession. Many patients having advanced signs have applied and had they been admitted, little hope of accomplishing anything in the way of relief could have been expected by their access to our State institutions. With these cases, however, there has, at times, been a most gratifying and unexpected improvement at "Home," and when I consider the limited means that we have at our disposal, the large number of patients, and the kind of cases dealt with, I have reason to be pleased at the favorable results thus far accomplished. We at the same time must spare no efforts to increase our facilities

in this work and manage and treat our patients so as to be productive of favorable results.

To illustrate this meaning, it will be well to state that first, the care of these patients demands proper clothing in winter, such as warm under-clothing, flannel nightgowns, nightcaps, heavy outside clothing, overshoes, warm gloves, fur coats. In summer a medium weight should be worn, with always a heavier outer garment at hand, as our climate is known for its sudden changes. The feet should always be properly protected from dampness, especially in stormy weather.

*Ventilation.*—"Ventilation" does not mean the opening of a window a little at the top, but either the upper or lower half of all the windows

wind, and yet giving a constant supply of fresh air, as all sides are open. The frame is erected, then covered with a coarse mesh wire netting up six or seven feet, then covered outside of this with medium heavy sheeting (unbleached), the only opening being the door, which is also covered the same as the sides. This could be improved upon by a porch on the sunny side. Camps, tents, etc., should always have the greatest amount of sunshine and woodland protection from east winds. Cleanliness to the tuberculous is particularly important and means the taking care of all sputa and body excretions. Sunlight is very important to all, especially those who are unable to go out, and



The camp most used by my patients.

in the room occupied should be open, and protected from the wind, snow, and rain by a screen frame covered with a medium weight cotton cloth, and securely fastened into the open space of the window, these so arranged as to fit top or bottom. Many patients sleep on a veranda inclosed with medium cotton (a southwestern side of the house is most desirable). Camps, tents, bungalows, shacks in the woods on hill-tops or high elevations are especially useful to those, who for reasons can do no better. I have in a number of cases employed a camp, of which a cut is furnished. This particular kind of camp rather appeals to me as one of the most desirable in giving protection from storms and

it should, therefore, be allowed to enter the room freely under all circumstances.

*Exercise.*—In reference to exercise, we should provide sufficient and healthful amusement to keep the patients content. Men, especially, who are in a fairly vigorous condition, do poorly in confinement. I allow, in selected cases, a considerable freedom of exercise, which no doubt some physicians would think unwise. Those able to take active exercise should be cautioned against overexertion. Systematic and enforced deep breathing is very important, thus supplying fresh air in a much greater quantity than otherwise would be taken. Outdoor games will afford one means of exercise; hill climbing,

long walks in pleasant weather, and farm work have been allowed some of the patients who are approaching a state of "arrest." Interest can be maintained by taking measurements of the chest at regular intervals. It should be understood that there are exceptions to these rules. I find there is a marked beneficial effect on the mental condition of the patients in allowing them freedom.

*Food.*—The question of food is very important. Simple, nutritious, properly cooked food in proper quantity, at regular hours is the prime factor. Milk and its products, eggs and other food containing a large amount of nourishment, yet easily digestible and assimilable, are among the most popular today.

A very important subject is the protection of others from infection. The fact is well conceded that the chief source of infection comes from the depositing of sputum promiscuously which dries and becomes dust and is inhaled into the lungs by well people. Although this is the chief source of infection, there are other factors which enter in, such as a predisposition, faulty habits of living, a bad hygiene, irregular hours for food, sleep, intemperance, etc.

We are obliged to work with our patients with a whole-souled interest. The examination of sputa, urine, body excretions and such work usually done in the laboratories of the medical schools, we ourselves must do, thus helping us over a very necessary, yet awkward and difficult obstacle, also keeping us directly in touch with our patients. The sputum should be examined as often as every two weeks.

The determination of the disease requires a great deal of thought, and many details have to be carefully considered to exert the supervision necessary for the best results.

My statements are made without the least desire to criticize those, who, while doing their utmost in the fight against tuberculosis, may differ with me in the details of the work. I wish only to emphasize the aims and requirements of "Home" care and treatment of those who unfortunately must stay at home and the many difficulties which I have had to meet, my only desire being that others may profit

by my mode of treatment and by whatever success I may have attained.

Since the beginning of my practice, from 1898 up to January 1, 1906, 197 patients, averaging 28 per annum (more females than males), 70 percent between 20 and 30 years, 20 percent over 30, 10 percent under 20, have been treated at home by me and there have been approximately 30 percent arrested, 49 percent improved, and about 21 percent not improved. The term "improved" is applied to patients whose life, without doubt, has been lengthened from six months to as many years. In recording results the term "arrested" is used in those cases in which all outward symptoms have ceased, such as cough, night sweats, sputa containing bacilli, fever, etc., the general condition being apparently perfect health at the time of discharge. The term "cured" has not been used by me, though many of the patients would seem to justify this expression. To me the term "arrested" is equivalent and more satisfactory than the less conservative one "apparently cured."

In comparing my results with other observers of former years I notice the fact that the percentage of incipient cases which have been "arrested" has steadily increased, a proof of the importance of seeing cases early in the history of the disease, instead of waiting until the symptoms become more marked.

You will notice that the percentage of my "arrested" cases is somewhat small at first sight, and would seem discouraging. When we study the previous history of the disease, however, we find reason to be encouraged. Yet, by properly and promptly meeting conditions, we can increase the amount of good done to the community by the "Home" method of taking care of our tuberculous patient.

The subsequent histories of my patients who have taken the "Home" treatment are naturally of great interest. I have made painstaking endeavors to trace all those who left my care with the disease "arrested." It is still early to make definite conclusions as to the lasting effects of the treatment when we consider the nature of the disease; but even at this stage of

the history, enough can be said to be of value. It must be remembered that much of my dealings have been with people of limited means, often with the poorest classes, who naturally return to the previous unfavorable crowded conditions of employment and living. Favorable results in such cases are therefore all the more gratifying.

Earnest endeavors should be made to keep people in hygienic surroundings after they leave the physician's care and to induce those who have lived in the city to take up a country life. As a matter of fact a great majority return, from necessity or otherwise, if not to exactly the same conditions, yet to employments which are more or less unfavorable to health. They should be taught to keep their windows open at night and form the habit of having good ventilation. All of these facts go to prove the educational value of institutions, as well as private instructions, and speak well for the cause of hygienic medicine, even when our efforts to overcome the disease may not be successful in individual cases.

Our aim should be to instruct patients how to regain their health when left to their own devices and to live under the most favorable conditions.

*Climate.*—As to the much mooted question of change of climate, it is perhaps well to reiterate statements which have been made by other careful observers that a climate which presents the best opportunities for life in the open air, with the maximum amount of sunshine, is best for the tuberculous, and that the chances of relapse there are smaller, yet for many of those who for reasons cannot go away, I believe that a large percentage can regain and keep their health by comparatively simple methods at home. It is true, undoubtedly, that patients who have gone to distant health resorts have done well, while some have lost ground, and upon returning home, have again improved; therefore I feel it is no longer wholly necessary to send patients away; I might add, especially in well-advanced cases.

*Methods of Treatment.*—It is impossible in this short paper to do more than give an outline of treatment. Improper digestion, hemoptysis, night sweats, persistent cough, diarrhea,

insomnia, high temperature, etc., call for medical attention and we are able to render valuable assistance with drugs; these indications having been properly met, considerable help is rendered. I employ what are now recognized as the essentials in all sanatoriums for tuberculous patients. I might add Sir Sydney Smith's formula, "Great temperance, open air, easy labor, no care." The greatest amount possible of *fresh air, sunshine, good food, proper exercise*, enjoined with supervision as far as possible in order to guard against the mistakes of diet, exposure, etc., which arise through ignorance in many ways, are practically all in the line of treatment.

As to the use of any one specific remedy, I can say that I have found nothing to equal the effect of the hygienic treatment, although at times overanxiousness has led to the using of specific (?) remedies which have given negative results. I can say, however, that in taking this position it has been only after many careful trials of much warranted "specific remedies" which have been impressed upon us that I am not wholly convinced by the statements and experience of those for whose opinions I otherwise have great respect. I have in some cases used tuberculin for diagnostic purposes, with results that have been of much value in determining the nature of doubtful cases, while in others results have been negative. Anti-streptococcic serums have also been used, not without some results, but of no special advantage.

## CLINICAL NOTES.

### PURULENT MENINGITIS (NOT EPIDEMIC) WITH MENINGOCOCCUS INTRACELLULARIS.<sup>1</sup>

BY

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The first investigations of Leyden, Yaeger, Netter, Fürbringer and others showed that

<sup>1</sup>Presented and specimen exhibited before the Pathological Society of Philadelphia, December 13, 1906.

Weichselbaum's *Meningococcus intracellularis* was the specific agent of epidemic cerebrospinal meningitis.

Although this microorganism has been found in 80 percent of cases, nevertheless the question of its absolute specificity cannot be settled, as on one hand other pathogenic agents have been seen associated with the meningococcus and on the other, the latter was found in purulent meningitis of not epidemic or sporadic character.

The case I am placing on record corroborates this contention.

A very thorough investigation revealed no possible local infection and the patient presented during life no characteristic symptoms of epidemic cerebrospinal meningitis.

The patient was a woman, aged 45, who had been addicted to alcohol for the last 10 years. She had several attacks of delirium tremens. A few days before death she drank considerably and then cleared up to a great extent.

Suddenly she developed confusion, became delirious, could not recognize surroundings. She was unable to give an account of herself. Her hallucinations were mostly visual. Illusions of identity were also present.

The pulse was rapid and the temperature was 99.5°. On the last day she became comatose. During her brief illness a lumbar puncture was made and *Meningococcus intracellularis* of Weichselbaum was found in the cerebrospinal fluid.

The mode and seat of invasion of this microorganism was difficult to determine, as a thorough examination of the body could detect no local injury, no erosion. The patient had no grippe, no erysipelas, no otitis. At autopsy the pia of the brain appeared clouded. Purulent deposit was found over the sulci of the entire brain, but particularly marked over the upper and lower surfaces of the cerebellum and on its median line especially.

**Mosquito War Begins.**—The second annual antimosquito campaign, the object of which is to prevent an outbreak of yellow fever in New Orleans, has begun and will continue until frost next November. Two hundred men will be employed to inspect conditions and search for sink holes or pools where mosquitos might propagate.

## SPECIAL ARTICLES.

### TESTS OF WATER BY BACTERIAL INOCULATION.<sup>1</sup>

BY  
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Having observed that the number of bacteria of one species which develop in a medium in a given time is constant and is independent of the number originally introduced, it occurred to me that the relative purity of a sample of sterilized water could be determined by the number of organisms which develop after inoculation and a short period of incubation.

To demonstrate this a series of experiments was performed from which the following conclusions were drawn.

I. If two tubes or flasks of a given medium (pure or contaminated water, or a dilute bouillon) be taken, one inoculated with but few and the other with many bacteria of one species, after a short period of incubation, the number of organisms will be approximately the same in each; *i.e.*, is independent of the number originally introduced. The length of time necessary to establish equilibrium is dependent upon the proportion of the number of organisms introduced, to the number which that particular medium is capable of sustaining.

II. The number of organisms, of a given species introduced into sterilized water, that will be found after a short period of incubation, is proportional (in some ratio), to the amount and character of organic matter present in it.

III. The extent of the development differs with the different species; being much greater in certain common water bacteria than among parasitic organisms. Thus, while *Pseudomonas fluorescens (liquefaciens)* will develop in great numbers in comparatively pure water, *Bacillus coli* will develop but little or not at all.

Prescott and Winslow (1904, p. 110) say: "A chemical examination of water for sanitary purposes is mainly useful in throwing light upon one point—the amount of decomposing organic

<sup>1</sup> From the Laboratory of Comparative Pathology and Bacteriology, New York State Veterinary College, Cornell University, Ithaca, New York.

matter present." If a technic can be devised to determine this point by means of a bacterial inoculation of a given sample of water, a valuable auxiliary test is obtained, and a deduction from the foregoing statements suggests this possibility. Thus a sample of water may be sterilized, standardized to an optimum growth reaction, inoculated with a suitable organism, and a count made after 24 or 48 hours of incubation; the total count indicating the relative purity of the water.

Bolton (1886) denied that any relation exists between the number of bacteria in a given water and its chemical composition, but Tiemann-Gaertner (1895, pp. 555 and 560) point out that the apparent inconsistency is due to the fact that different organisms are differently affected by the organic constituents of the water, so that a total count of the bacterial contents when many species are present, is misleading, while when there are but few species their number is a good criterion of the amount of organic matter.

In order to perfect a technic, to obtain comparable and reliable results, it will be necessary to make a large series of additional experiments to determine the following points: 1. The behavior of various organisms in different waters as in sewage contaminated waters, waters rich in humus matter, etc.; and under various conditions. 2. The chemical composition of all the test samples used. 3. Effect of different incubator temperatures. 4. Effect of various amounts of water, and size and form of flasks. Whipple (1901, p. 276) has shown that the size of the vessel has marked effect on growth. 5. Whether any difference results in using a fresh culture for purposes of inoculation or an old one. 6. Effect of standardizing the reaction before inoculation. 7. Whether an organism may be found which in all cases can be made to grow freely in sterilized water. In my experiments, it was necessary occasionally to inoculate a second time to produce growth, even when using *Pseudomonas fluorescens*.

#### METHOD EMPLOYED IN CONDUCTING EXPERIMENTS.

Thirty cubic centimeters of the water (except when otherwise stated) was placed in a large

test-tube, provided with a cotton stopper, and sterilized in a steamer. By means of a loop a small amount of a fresh colony of the bacterium to be inoculated was carefully taken and stirred into a small beaker containing about 10 cc. of sterile water. A drop (or more) of this liquid was then transferred to each of these tubes of water, which were then set aside for 24 or more hours. When *B. coli* was introduced the tubes were placed in the incubator, while for *Ps. fluorescens* they were left at room temperature. Counts were made in the usual manner, diluting when a large development was suspected. Agar plates were used almost exclusively. Before plating, the water in the tube was gently but thoroughly stirred.

To obtain uniform results the following precautions were observed; the temperature of the sample was kept uniform, the tubes and flasks were absolutely clean and of the same size, care was taken that no medium was introduced with the organisms, fresh pure cultures were used, and the reaction of the sample was made slightly alkaline to litmus. The water was rendered sterile by heat rather than by means of filtration to guard against possible inhibitory effects of enzymes, as has been shown to be the case by Frankland (1894, p. 229).

That little or no media was introduced with the organisms in inoculation was determined by taking a small amount of a colony and rubbing it carefully on a cover-glass, and then staining. The lack of background indicated little or no media, certainly very little in comparison to the bulk of the stained organisms. The same fact is also amply demonstrated in Experiments I to VII inclusive; for if organic matter were present the bacterial count would have shown variation. Bolton (1886) in experimenting with *M. aquatilis* and *B. erythrosporus* also showed that the multiplication in distilled water was not due to organic matter that might have been introduced with the bacteria.

*To show that in a given medium the number of organisms developing after a short period of incubation, is independent of the number originally introduced.* (Experiments I to VII inclusive.)

EXPERIMENT I.—Sterilized distilled water with a minute quantity of standard bouillon. Inoculated with *B. coli*.

No.	No. per cc. introduced.	After 24 hours growth, per cc.
1	100	566,000
2	80	548,000
3	40	583,000

The average of the three is 565,666 or differing from Nos. 2 and 3 by 3 percent.

EXPERIMENT II.—Water with a small amount of sewage added. Inoculated with *B. coli*.

No.	No. per cc. introduced.	After 24 hours growth, per cc.
1	150	400,000
2	375	350,000
3	800	390,000
4	1,200	370,000

The average of the four is 377,500 or differing from the most divergent case (No. 2) by about 7 percent.

EXPERIMENT III.—Water with still smaller amount of sewage added. Inoculated with *B. coli*.

No.	No. per cc. introduced.	After 24 hours growth, per cc.
1	200	240,000
2	300	220,000
3	600	250,000
4	1,600	200,000

The average of the four is 227,500, thus differing from the most extreme case (No. 4) by about 12 percent.

EXPERIMENT IV.—Pond water of doubtful purity. Inoculated with *B. coli*.

No.	No. per cc. introduced.	After 5 days growth, per cc.
1	11	5,050
2	125	5,210
3	600	4,900
4	3,000	5,000
5	102,000	4,800

The average of the five is 4,992 or differing from the most extreme case (No. 2) by about 4 percent.

EXPERIMENT V.—Water in which leaves had been macerated for several days. The water was quite turbid, had a decided odor and was swarming with bacteria. It was sterilized and then inoculated with *B. coli* for which organism it proved to be a poor medium.

No.	No. per cc. introduced.	48 hours.	3 days.
1	140	300	0
2	210	270	0
3	400	200	0
4	900	240	0

This experiment shows that a relatively large amount of organic matter of vegetable origin will not support *B. coli*, while Experiment III shows that a very small amount of fecal matter is an excellent medium for this organism.

EXPERIMENT VI.—When 30 cc. of artesian or tap water (from a filtered supply) in a large test-tube was inoculated with *B. coli* the organisms invariably died out in from 24 to 48 hours. One hundred cubic centimeters of water in an Erlenmeyer flask inoculated with *B. coli* repeatedly gave the same results.

EXPERIMENT VII.—Tap water (from a filtered supply) inoculated with *Pseudomonas fluorescens liquefaciens* (var. nov.). The organism used in this experiment possesses the morphologic and cultural characters described by Migula (1901), but possesses in addition peculiar features not mentioned in the descriptions. When inoculated into glucose bouillon, the media becomes reddish in color with a brick red sediment. In glucose agar, the surface growth is at first sordidly brown which later becomes red. At the same time the media, which first becomes fluorescent, is later gradually changed to a beautiful cherry red. This change is hastened by breaking the surface with the platinum needle. The organism has a tuft of polar flagella, agreeing in this respect with Migula's characterization of the species.

One hundred cubic centimeters of water was used and placed in an Erlenmeyer flask.

No.	No. per cc. introduced.	24 hours incubation.	48 hours incubation.
1	220	15,000	1,200,000
2	5,400	1,000,000	1,150,000

This experiment shows, first, that the nearer the number of bacteria which are introduced is to the number which finally develop, the shorter is the time required to establish equilibrium; and second, that this organism is capable of enormous multiplication in a comparatively pure water.

To show that the number of bacteria developing in a medium is dependent upon the amount of organic matter present. (Experiments VIII, IX, and X.)

EXPERIMENT VIII.—Water with some nearly fresh sewage added. Five dilutions were used; and designating No. 5 as 100 percent, the strengths ranged 4 percent, 16 percent, 30 percent, 50 percent, and 100 percent. A partial

chemical analysis of No. 1 gave the following results, expressed in parts per million. Chlorin 2.5; ammonia free 0.525; albuminoid ammonia 0.161; oxygen consumed 2.0; nitrate .031; nitrite, trace; alkalinity 2.5; turbidity 00. Hence multiplying each item of No. 1 by 4 will give composition of No. 2; by 7.5 gives No. 3; by 12.5 gives No. 4; and by 25 gives No. 5. Inoculated with *B. coli*.

No.	Per- cent.	No. per cc. introduced.	1 day.	2 days.
1	2.5	7,060	1,500,000	4,050,000
2	12.5	7,060	5,625,000	16,880,000
3	37.5	7,060	11,250,000	20,470,000
4	100.0	7,060	15,000,000	24,500,000

EXPERIMENT XI.—*Pseudomonas fluorescens*

No.	Percent.	No. intro- duced.	40 hours.	3 days.	5 days.	7 days.	15 days.	63 days.
1	4	2	60,000	250,000	2,115,000	850,000	118,000	6,000
2	16	2	1,200,000	2,400,000	3,525,000	1,900,000	400,000	18,000
3	30	2	8,000,000	10,500,000	21,150,000	564,000	270,000	40,000
4	50	2	15,000,000	17,500,000	23,300,000	12,700,000	800,000	70,000
5	100	2	30,000,000	31,500,000	28,500,000	21,150,000	1,920,000	800,000

Owing to the evaporation of much of the water in the tubes, the count on the sixty-third day does not represent the correct proportion relatively to the earlier counts.

EXPERIMENT IX.—Standard bouillon diluted with sterilized distilled water. Dilution is expressed in parts per million; thus No. 1 is pure distilled water, while No. 2 has 62.5 parts of bouillon to 1,000,000 parts of water solution. Inoculated with *B. coli*.

From the foregoing it appears that the maximum is reached in the weaker solution sooner than in the stronger, thus confirming the results of Cramer (1885).

(*liquefaciens* var. nov.) inoculated into various waters.

No.	No. per cc. introduced.	1 day.	2 days.	3 days.	4 days.
1. Creek water	5,400			1,800,000	1,900,000
2. Tap water	5,400	400,000	525,000	750,000	1,300,000
3. Water and sewage	5,400			3,000,000	12,000,000

No.	Parts per million.	No. per cc. introduced.	1 day.	2 days.	4 days.	8 days.
1	0.0	175,000	162	00,000	0,000	0,000
2	62.5	175,000	370,000	664,000	160,000	57,800 <sup>1</sup>
3	312.0	175,000	1,320,000	6,300,000	7,000,000	7,800,000
4	1875.0	175,000	5,300,000	17,600,000	22,000,000	21,676,000
5	6250.0	175,000	25,000,000	30,000,000	31,000,000	31,250,000

To show that certain water bacteria grow more freely than *B. coli* in comparatively pure waters. (Experiments X and XI.)

EXPERIMENT X.—Water containing sewage. No. 1 was perfectly clear and odorless, and contained about  $\frac{1}{30}$  as much sewage as sample No. 1 of Experiment VIII. Considering the amount of sewage in No. 4 as 100 percent, the relative amounts in Nos. 1 to 4 inclusive are 2.5 percent; 12.5 percent; 37.5 percent; and 100 percent respectively. Inoculated with *Ps. fluorescens*.

Solution No. 3 contained about  $\frac{1}{32}$  as much sewage as sample No. 1 of Experiment VIII, and thus is seen to be very low in organic matter. This experiment shows the extreme sensitiveness of the bacteria to a very slight change in the amount of organic matter present.

In conclusion it may be said that the results recorded above confirm numerous experiments of various authors. Bolton's experiments with

<sup>1</sup> The eight day test of No. 2 is inaccurate owing to a too great dilution in making the plates.

two water bacteria showed extensive development in both well water and distilled water; Wolffhügel and Riedel (1886) obtained similar results. Rosenberg (1886) again, introduced a series of water organisms, which he had isolated from the river Main, into sterilized distilled water, and from that, while the majority of varieties underwent rapid multiplication for a short time, three of the species employed quickly died off in distilled water. Miquel (1891) claims that absolutely pure, distilled water free from organic matter and salts will not sustain bacteria. Heraeus (1896) has shown that not only quantity but quality of the nutrient material affects bacterial multiplication. That both of the parasitic forms *B. typhosus* and *Microspira comma* require relatively large amounts of nutrient matter in water in order to multiply has been demonstrated by Bolton (1886).

The results obtained show a striking relation between the number of bacteria and the amount of organic matter present; they show that the number of organisms of a given species which may be introduced is independent of the total number which subsequently develop; and finally, that the different bacteria multiply at different rates depending upon the amount and character of the nutrient material. I am convinced that the method suggested at the beginning of this article, or some modification of it, may profitably be applied as an auxiliary test in the analysis of potable water and it is hoped that other investigators may feel inclined to perform the necessary additional experiments, which time and opportunity did not permit me to make. The experiments outlined in this paper were made in the laboratory of Dr. V. A. Moore, to whom I extend heartiest thanks for the favors shown.

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## DIGEST OF LITERATURE.

## ADVANCES IN OPHTHALMIC THERAPEUTICS.

BY

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and

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In reviewing the literature relative to the newer remedies used in ophthalmic practice and the newer methods employed in the administration of some of the older drugs, it is noted that those which have awakened most interest and discussion are the silver preparations, local anesthetics, and the suprarenal derivatives. There is no consensus as to the relative value of the silver salts or to their special virtues. For instance, argyrol is enthusiastically praised by some observers and equally condemned by others. Between these contending factions is a middle party, who hold that its virtues are negative; that it is simply a useful detergent; and is not followed by the harmful results often seen in connection with the use of the stronger silver preparations in careless or inexperienced hands. Among the anesthetics, alypin seems to be increasing in popularity, as it is reported less poisonous than holocain and stovain, while sharing equally with them the advantage over cocain of not affecting the pupil or the ciliary muscle, and not altering the nutrition of the cornea. Adrenalin retains its popularity in the treatment of external diseases of the eyeball and its appendages, but its use as an adjuvant to eserin in glaucoma has been as seriously questioned as it was formerly warmly advocated. In giving a synopsis of the literature it has been deemed advisable to follow an alphabetic arrangement.

*Acoïn* apparently has ceased to excite much attention. Hinshelwood<sup>1</sup> recommends its use to prevent the five or six hours of suffering following the subconjunctival injection of various drugs. He first anesthetizes the conjunctiva with cocain and then injects beneath it 10

minims of a solution containing 1 percent of acoin and 2 percent of cocain, following this in five minutes by the medicament indicated. Weeks<sup>2</sup> uses acoin in removing foreign bodies as it has neither mydriatic nor cycloplegic action.

**Adrenalin.**—Grandclément<sup>3</sup> has applied adrenalin in a case of acute glaucoma of two days' duration with complete success, although the tension was excessively high and vision entirely gone. The solution used was adrenalin (1-1000), 3.0; eserin, 0.05; distilled water up to 10.0—one drop being instilled every half hour. Vision was restored to two thirds of normal. In a case of keratoconus, vision also improved, although the tension was but slightly lowered. He considers it suited only to those patients in whom permanent changes have not had time to develop. In one of his cases of but a month's standing it failed. Hinshelwood<sup>4</sup> also has found that it markedly increases the effect of eserin in contracting the pupil and reducing tension in inflammatory glaucoma. Senn<sup>4</sup> reports two cases of glaucoma in which adrenalin, 1-1000, was instilled (in one case with eserin and in the other alone) and distinctly increased pain, tension and loss of vision. If the adrenalin dilates the pupil ad maximum before it contracts the ciliary vessels this, of course, would lead to an acute attack; and if it also constricts the anterior ciliary veins this would interfere with the outflow. Wessely<sup>5</sup> explains the variance in results by the differences in the strengths used. Phillips<sup>6</sup> instills suprarenal extract from three to ten times daily in ulceration of the cornea, to lower tension, restore nutrition and prevent escape of albumin; at the same time using a 5 percent solution of nuclein to build up the tissues. Hinshelwood has found no congestion that will not disappear after repeated applications of adrenalin, although the more intense the condition the shorter the anemia. He has used it successfully for the relief and permanent cure of the hyperemia causing the sensation of sand grains on the eye. The editors have used it after applications of silver nitrate with very marked alleviation of the pain, and have also found it very useful in reflex hyperemias of the conjunctiva from nasal disease, etc. Carleton<sup>7</sup> reports relief of severe congestive supraorbital pain in a number of cases in three and one-half minutes after inunctions of one minim of adrenalin ointment over the nerve-exit, and considers the application of diagnostic value, nonrelief pointing to some organic lesion. It had no effect on the pain in a case of iritis. It is indicated in functional dis-

turbances such as those from eyestrain. Cohn<sup>26</sup> advises *eusemin*, a preparation containing cocain and adrenalin with chloretone in normal salt solution, for small operations on the eyelids, limiting the amount to be used to half a Pravaz syringeful.

Ostwalt's<sup>8</sup> device for generating *superheated dry air* will appear to any one who has superintended the fatiguing process of applying hot compresses, or who has the discouraging suspicion that heat and warmth are interchangeable terms in the patient's or untrained nurse's vocabulary. His apparatus consists of a coiled tube, a lamp, and a rubber bag to blow in the air which becomes heated on its way. Most patients will not stand more than 100° F., while some can bear as high as 175°. After an application the temperature may be gradually lowered by extinguishing the lamp and keeping on with the blowing. He advises also the use of cotton-wool pads over the eye for a short time after the treatment.

Valude<sup>9</sup> reports cases of blepharospasm and Abadie and Dupuy<sup>66</sup> a case of facial spasm, cured by injections of *alcohol* at the point of exit of the facial nerve from the stylohyoid foramen, according to the technic of Schloesser. The paralysis caused by the injection lasts some days and then passes off without recurrence of the spasm.

*Alypin* seems to have many partisans. Jacobsohn<sup>9</sup> recommends it in 2 percent to 5 percent solutions as causing less damage to the cornea than cocain and finds its anesthetizing power is much higher. It dilates the conjunctival vessels and causes some smarting but does not affect the pupil nor accommodation. It may be boiled with safety for from five to ten minutes. Jacques<sup>10</sup> thinks it slightly more painful than cocain. On the other hand, Stephenson<sup>10</sup> declares that smarting is neither so frequent nor so marked as from the same strength of cocain. He and Jacques each use a 2 percent solution. Scherer<sup>11</sup> adds that in addition to its other advantages it is much less poisonous than cocain. As it does not cause mydriasis, nor affect accommodation, nor intraocular pressure, Jacobsohn and Seeligsohn<sup>12</sup> have found it a valuable substitute for cocain in operations for glaucoma. Seeligsohn uses, after boiling, a 4 percent solution for various operations, including discission and cataract extraction. Various investigators report that anesthesia may be induced in from 50 to 120 seconds, this lasting from 8 to 15 minutes. According to Seeligsohn even inflamed eyes may be anesthetized by repeated instillations. Truc<sup>67</sup> calls attention to

the importance of having neutral solutions, as acid ones act as irritants.

*Anesthesin* causes a more prolonged period of anesthesia than alypin, lasting about a half hour according to Chevalier<sup>13</sup>, the effect not being complete until 10 or 12 minutes after instillation. He prefers solutions in olive oil, 1-15. It may also be used by insufflation or in the form of an ointment. He advocates it in the treatment of keratitis, iritis, and sclerorchoroiditis for the relief of pain.

Valude<sup>14</sup>, in continuing his observations on the use of antipyrin in optic atrophy, finds that it is valuable only in the descending variety from an acute brain lesion. It is useless in simple atrophy, toxic and tabetic forms, and those due to chorioretinitis. He injects on every second day 2 cc. of a 50 percent watery solution with  $\frac{1}{8}$  percent of cocain in the dorsolumbar region, discontinuing if there is no result after 25 injections.

*Argyrol*.—Notwithstanding Alvarado's report of the opinion of 31 prominent ophthalmologists who prefer the nitrate to the other silver salts, argyrol still has many enthusiastic supporters who use it either alone or as an adjuvant to the nitrate; in the latter capacity acting as emollient and cleansing agent through its power of floating to the surface the inflammatory detritus, etc., buried in the folds and crevices of a swollen conjunctiva. Fage<sup>15</sup> would reserve silver nitrate for only the more serious conditions, and believes that protargol and especially argyrol must come to occupy important places in the treatment of inflammatory diseases. Both Hinshelwood<sup>16</sup> and Stephenson<sup>17</sup> refer to the dangers from silver nitrate in inexperienced hands, and the latter speaks of the tendency of largin and protargol to cause staining of the tissues. In his experience argyrol has never done harm and he considers it "an efficient, speedy, and painless remedy in most superficial affections of the eye." Hinshelwood has found freshly made solutions always absolutely bland, while those which have been exposed to the light are irritating. He now orders cartridge paper pasted around the bottles, which latter must also be kept in the dark. He has seen a few cases in which there was slight staining of the conjunctiva after instillations three times daily for from six to twelve months, and one case of skin discoloration from laceration of the tissues of the lacrimal canal by the syringe. He considers argyrol to possess at least as great bactericidal properties as any of the other salts, and believes that less favorable reports of its actions have been due to too weak solutions or

too infrequent applications. He warmly advocates its use in ophthalmia neonatorum and other forms of conjunctivitis, in foul corneal ulcers, blepharitis, and lacrimal disease. In severe ophthalmia neonatorum he uses a 20 percent solution every hour, or in milder cases every two, three, or four hours, painting on a 30 percent solution once daily after careful eversion of the lids. In blepharitis he scrubs in a 20 percent or 30 percent solution with a firm camel's hair brush. When treating the tear passages he slits the canaliculus and drops the argyrol into the conjunctival sac allowing it to work its own way down the canal. In these cases he begins with a 10 percent solution, gradually increasing it to 20 percent. Darier<sup>18</sup> speaks just as strongly in its favor as regards the treatment of infantile conjunctivitis, using in purulent cases a 25 percent solution every hour or half hour, and in a slight catarrhal conjunctivitis a 5 percent solution four or five times daily, and he finds these solutions painless if fresh. Weeks<sup>2</sup> considers argyrol one of the best remedies we have for purulent conjunctivitis and lacrimal disease, and Lloyd-Owen<sup>3</sup> believes it the most trustworthy of all the organic compounds. Derby's<sup>61</sup> conclusion from his laboratory experiments is that argyrol is an almost inert substance so far as bactericidal powers are concerned and that it acts mechanically by washing away the pus; and he explains the limited efficiency of all the silver salts in gonorrhoeal inflammations by the neutralizing influence of the blood-serum as soon as the application comes in contact with the living tissues. Myles Standish and H. Bruns commend the so-called "immersion treatment" with solutions of argyrol in cases of purulent conjunctivitis. In common with several Philadelphia observers, deSchweinitz believes that no small factor in the popularity of argyrol is a negative virtue—its comparatively feeble action. Even when energetically used it is not dangerous.

*Aristol*.—Daxenberger<sup>19</sup> recommends a 10 percent solution of aristol in oil of sesamum for inflammations of the eyelids, in phlyctenular keratitis, traumatic abrasions of the cornea, after cauterization, and after lime burns. He believes the scars are smaller and less dense after its use. The solution remains stable and pure for a year after sterilization. This oily preparation is not only nonirritating but relieves pain. Pym<sup>20</sup> also points out the superiority of oil as a *menstruum*, reporting a case of atropin conjunctivitis occurring in the course of an iridocyclitis. By changing from a watery to an oily solution all irritation ceased. The oil

was boiled and the atropin added when cool.

**Brometone.**—For the relief of asthenopia and asthenopic headaches which lenses have failed to cure, Kyle<sup>21</sup> recommends five grain doses of brometone every three or four hours. The proportion of cases in which proper lenses do not give complete comfort is so small, however, that any careful oculist must resort to sedatives most unwillingly and with much questioning as to the accuracy of his findings.

Bock<sup>22</sup> once more advises cuprocitrol for trachoma since it causes no cicatrices and no discomfort to the patient and is equally efficient in recent and in old cases, in the latter giving better results than silver nitrate or copper sulfate.

**Dionin.**—Weeks,<sup>2</sup> Lloyd-Owen,<sup>23</sup> and Bulson<sup>24</sup> all report favorably on the absorptive and anesthetic qualities of dionin in iritis, corneal ulcers, and glaucoma. Bulson also advises its use in intraocular hemorrhage and as a substitute for discission in secondary cataract. In a case of separation of the retina of two months' standing, Darier<sup>25</sup> has obtained reattachment after injecting 0.02 gm. He also finds dionin valuable in chronic conjunctivitis, in infected operation wounds, and in acute glaucoma when operation is refused, or as a preliminary to operation. He uses it to assist in loosening foreign bodies in the cornea through the edema it brings about, and, like Bulson, after cataract operations. Hinshelwood<sup>62</sup> claimed that it is the most powerful means at our disposal for clearing up corneal opacities. v. Arlt<sup>63</sup> uses it in powder form with powdered atropin in the conjunctival culdesac in the treatment of old synechias. Ryerson<sup>64</sup> reports rapid absorption of hemorrhages and cataractous lens matter from its instillation.

**Electricity.**—Lloyd-Owen believes that electricity is to hold a more important place in ocular therapeutics and explains the negative results of the past by the statement that too weak currents have been used. He reports improvement in such diseases as tabetic, retrolbulbar, and secondary neuritic atrophy, once considered hopeless.

Popow<sup>27</sup> records a number of operations in which he used *frynin* as the anesthetic. These include operations on the punctum lachrymale, two iridectomies, and one discission. He obtains the frynin from the cutaneous and parotid glands of toads by Krakow's method. It causes engorgement of the vessels and slow anesthesia, with less effect on the corneal epithelium than cocain. It has no effect on accommodation nor acuteness of vision.

Fromaget<sup>28</sup> has had good results after failure of other treatment in four cases of recurrent vitreous hemorrhages from hypodermic injections of a 2 percent solution of *gelatin*. He used from 50 to 150 cc. at each injection, given at intervals of several days.

**Holocain.**—Hinshelwood<sup>1</sup> values holocain on account of its negative effect on the cornea, iris, and ciliary body, its one drawback being dilation of the capillaries. A 10 percent solution is powerfully antiseptic, which is another advantage in the removal of foreign bodies. It is preferable to cocain for the pain of corneal ulceration, and can be prescribed in ointment with atropin. In deepseated pain its analgesic qualities are greater than those of cocain, and it is therefore valuable in glaucoma, especially since it neither raises tension nor dilates the pupil. It must not be used for subconjunctival injection or for introduction into the tear passages, as it is much more poisonous than cocain. Weeks<sup>2</sup> considers it of great value in ophthalmic surgery.

**Iodopin** is preferred to mercurials by Menacho<sup>29</sup> for subconjunctival injection in interstitial keratitis, on account of its being less painful. It can also be used when the commonly used iodids by the mouth are not tolerated. One drawback to its use is that it sometimes causes yellowish swellings in the conjunctiva which remain for months.

**Iodoform.**—Dimmer<sup>30</sup> reports 25 cases in which plaques or batônnetts of iodoform were introduced into the eyeball after traumatic or nontraumatic infections. He found these were tolerated even by the vitreous and believes that it was by means of them that several eyes were saved, with resultant good vision. Frank<sup>31</sup> considers that Haab's iodoform rods have been markedly detrimental in some cases, and Cohn<sup>32</sup> finds that panophthalmitis and systemic ophthalmia are more frequent after the injection of iodoform into the anterior chambers and vitreous than when this is omitted. He thinks its use and that of xeroform should be limited to the external surface of the eyeball.

Ogier<sup>33</sup> believes that *isophysostigmin* will become more popular than eserine as a myotic. He finds that it contracts the pupil more quickly and the effect lasts longer, though on the other hand it is more easily neutralized by atropin.

**Jequiritol.**—Coppez<sup>34</sup> reports that his results in trachoma from the infusion of jequiritol and from its active principle jequiritol have been the same. He uses Merck's outfit, containing vials of graduated strength, together with the neutralizing *jequiritol serum*. He applies cocain

first, avoiding bichlorid washes; and begins with 10 mg. of the No. 1 preparation, increasing daily from 10 to 50 mg., and then using the No. 2 vial, increasing the dose of that also. When there is a reaction he waits until this subsides, and resumes with the dose that caused the inflammation, discontinuing applications usually after the second reaction. He has had to apply the serum only once to modify the severity of the results. He uses jequiritol mainly for the acute exacerbations of trachoma, following it by the usual surgical and other measures. In mild cases of trachoma the disease is favorably modified by weak solutions even when no reaction is reached, and it has been of undoubted advantage in persistent phlyctenular disease, chronic conjunctivitis, pseudopterygium, and after conjunctival burns. DeWecker<sup>35</sup> combats the statements made in its behalf in the award of the von Graefe medal and states that equal doses of jequiritol do not produce the same results in all eyes and that there are complications which do not occur with the infusion and which are influenced by *antiabrin*.

Bariklow<sup>37</sup> claims that he can cure trachoma by *massage of the conjunctiva* with a glass rod, the lesions disappearing without scars.

*Mercury* as a prophylactic in sympathetic ophthalmia is advocated by Heddaeus.<sup>38</sup> He states that, after suppuration has occurred, mercury may perhaps do harm rather than good, but when there are irritation, tenderness, and prolonged injection after an injury, with or without perforation, mercury may prevent a worse condition. Frank<sup>39</sup> reports a number of cases of perforating and infected wounds treated vigorously with mercurials, 14 out of 20 eyeballs being saved. Sympathetic ophthalmia is prevented as long as the treatment is kept up, and it must be continued until all signs of inflammation have disappeared. Lindahl<sup>40</sup> states that sodium salicylate acts more surely and promptly in these conditions than mercury. Abadie<sup>41</sup> believes mercurial injections are the most important thing in retinochoroiditis. His formula is: mercury biniodid, 1 gm., potassium iodid, 2 gm., salt solution (7-1000), 50 gm. Of this he injects 2 cc. every day or two. If the intramuscular injection fails he uses the solution intravenously. Roy<sup>36</sup> advises subconjunctival injections in syphilitic iritis, using six to eight drops of a 1-2000 solution of the bichlorid with 4 mg. of cocain every second day and follows this on the intervening day with an injection in the temple. If the pains are very severe both injections are given at once. Alex-

ander<sup>71</sup> states that subconjunctival injections of bichlorid cause an irritable condition which persists after the disease for which they were given is cured, and says further that there is no proof that the bichlorid reaches the interior of the eyeball. It acts merely as any other salt by causing currents of diffusion. He is opposed, however, to the subconjunctival method of administering any drug, citing various lesions resulting from injections of normal salt solution. Verlaine,<sup>72</sup> on the other hand, after large experience, reports very beneficial results from salt injections with only slight irritation, while from his injections of mercury he had as serious results as those of Alexander from the sodium chlorid.

Painblau and Taconnet<sup>42</sup> claim that a 1-500 to 1-300 solution of *methylene-blue* prevents disease of the cornea in the conjunctivitis of variola, and state that infiltration, if present, quickly disappears if the above is instilled several times daily. They also recommend it in purulent ophthalmia.

Vain<sup>43</sup> uses a 10 percent solution of *potassium permanganate* in purulent ophthalmia to the exclusion of the silver salts. Powell reports two cases of injury to the eye from contact with the crystals. In one there was great swelling, abrasion of the conjunctiva and sloughing of the skin near the inner canthus. These cases improved under the use of boric wash and instillations of castor oil, and no permanent injury resulted.

Lawson<sup>45</sup> reported very favorable results from the use of a lotion of *quinin*, gr. vi to f3i, in the treatment of corneal ulcers, especially those which would not respond to the ordinary remedies. The ulcers included those involving the deeper layers of the cornea, marginal scalloped ulcers, infected ulcers without undermined edges (if not acute with hypopyon), neuropathic ulcers and marginal ring ulcers. In making the lotion, barely enough acid must be added to insure solution. If there are not decided results in a week it can be discontinued. After no other treatment has he found the scar so translucent.

*Radium*.—Cohn<sup>46</sup> has had in a few cases of trachoma excellent results from applying a fine glass tube containing 1 mg. of radium to the end of each granulation, these disappearing rapidly and painlessly. The treatment was given for 15 minutes daily. Jacoby<sup>69</sup> questions whether the results from the radium treatment may not be due to the massage used in applying it and the following hyperemia. His own results were inferior in safety and permanence to those from other methods, and he

thinks that in using it valuable time may be lost.

Among *sodium salts* Trousseau<sup>47</sup> recommends the *hyposulphite* as a lotion. It has certain antiseptic powers although laboratory investigations show it not to be a true germicide. A 5 percent solution is nonirritant and nontoxic when used as an irrigant or in a warm compress. Schiele<sup>48</sup> advises *sodium iodate* injections for phlyctenular disease, in the temple when the nodules are in the sulcus subtarsalis, and subconjunctivally when they are on the bulb. He uses a third to a half of a syringeful of a 50 percent solution in the temples three or four times and a 1 percent solution subconjunctivally when the cornea is involved. Fox<sup>49</sup> reports benefits from subconjunctival injections of *sodium sacchariate*, 5 to 15 grains to the ounce, in inflammations and opacities of the cornea, and opacities of the vitreous. Lindahl's<sup>40</sup> results from *sodium salicylate* in sympathetic ophthalmitis have been referred to. He uses from 4 to 6 gm. daily, and finds it most efficacious in sympathetic iritis and iridocyclitis.

Bosse<sup>50</sup> reports considerable gain in visual acuity in a case of tabetic nerve atrophy from extract of oxen's testicles and, later *spermin* injections. The increased visual power persisted five months after treatment. Jacoby<sup>51</sup> reports a case of recent syphilis with tabes in which there was marked improvement from injections of Poehl's spermin, although mercury, electricity and gymnastics had failed.

*Stovain*.—Foisy<sup>52</sup> concludes from his experiments that stovain in solution with adrenalin is contraindicated as an injection in man on account of its causing a slough at the point of entrance. The cocain-adrenalin combination causes perfect anesthesia and has feeble toxicity. Santos,<sup>73</sup> on the contrary, claims that there is no danger from syncope when stovain is used, as sometimes happens after cocain injections.

Colasuono<sup>53</sup> advocates *thigenol* in corneal ulcers and finds it especially valuable on account of its penetrating qualities. Remaux<sup>54</sup> prefers it to ichthyol as it is odorless and nonirritant. It is a vasoconstrictor and a cure in blepharitis has been reported in two or three weeks. After cleansing, the lid-edges should be thinly painted and the application left on over night.

Birnbacher<sup>55</sup> considers *trigemin* as a remarkable analgesic in any sort of ciliary pain, such as that from acute glaucoma and cyclitis. The dose is 0.25 gm. in a capsule.

*Tuberculin*.—Nias and Paton<sup>56</sup> have advocated the tuberculin treatment for persistently

recurring phlyctenules in cases in which there is no systemic tuberculous infection. V. Hippel<sup>57</sup> has had most encouraging results from tuberculin T. R., especially in eyes once considered hopeless. He has used it in tuberculosis of the conjunctiva, sclera, cornea, iris, and ciliary body, beginning with  $\frac{1}{500}$  mg. on alternate days and increasing the dose very slowly up to  $\frac{1}{5}$  mg. in the worst cases. The dose must not be increased if the temperature is above 100.5° F. in serious cases injections must be kept up for six months. The tuberculin operates not as a germicide but by inflammatory reaction and cicatrization. There is no effect on the general health. Stanculeano<sup>58</sup> has tried injections of tuberculin T. to decide the etiology of interstitial keratitis but without satisfactory results, patients apparently free from tuberculosis reacting, and in only one or two instances was any change noted in the keratitis. Einseln's<sup>59</sup> different results were probably due to the administration of too small doses. Koster<sup>60</sup> thinks tuberculin should be tried after the failure of other remedies, especially, in tuberculosis of the ciliary body and choroid. It must be used with great care when large foci exist in other parts of the body, on account of the severity of the reaction.

Wray<sup>74</sup> reports two cases of tobacco amblyopia showing marked improvement from drinking large quantities of *water*. He points to the association of tachycardia with toxic amblyopia, the former being due to the effect of the smoke on the pulmonary endings of the cardio-inhibitory nerves, and the latter to the poison in the blood. Nicotin is soluble in water and is eliminated by the kidneys, skin and lungs. Wray directs the patient to drink one pint of warm water at 7 a. m., walk in the open air for a half hour, then drink another pint, and walk again, following this with breakfast. The same quantity must be taken at 11:30 a. m. and at 4 and 9 p. m. Potassium iodid may also be used as a diuretic but visual acuity has increased with the water alone.

*Yeast*.—Ginestous reports very favorable results in phlyctenular disease from a less heroic remedy than that advocated by Nias and Paton. In 25 cases he administered yeast—to adults 4 gm. and to children 2 gm., while he made at the same time the usual local applications.

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- <sup>75</sup> *Gaz. hebdom. des Sciences méd. de Bordeaux*, January 15, 1905.

## RECENT EDITORIAL OPINIONS.

**Journal of the American Medical Association.**—FANTASTIC THEORIES OF THE CAUSE OF APPENDICITIS: Regarding the causation of appendicitis a great deal of nonsense has been written in the past 10 or 12 years. The theory that the affection is due to red rubber is based on the same premise that supports the boric-acid theory, namely, the use of the substance and the disease have increased together. This might be said of the use of the telephone yet no one ascribes to it the prevalence of appendicitis. Theorists would do well to remember Guell's aphorism, "savages explain, science investigates."—THE FOOD VALUE OF VEGETABLE GELATINS: The most that can be said for the lichen and algæ jellies is that they are harmless but nonnutritious. This is in strong opposition to the statements made by promoters of "vegetable gelatins." Of one preparation from the Michigan headquarters for health foods it is said: "Its food value is more than double that of an equal weight of eggs or beef-steak." This preparation is simply agar-agar and about as nutritious, though far more edible, than a corresponding quantity of newspaper pulp.—THE ALLEGED DECREASING LONGEVITY:

Newspapers are commenting on census statistics which indicate that human longevity in this country is becoming impaired. One says that "notwithstanding improved medical knowledge and the benefits of modern sanitation, we are dying earlier than our grandparents did." Even some physicians do not understand that the general average of human life has increased, infant mortality particularly decreasing. This naturally increases the deathrate in later ages but that this increase can be put off until after the active period of life is a favorable showing for medical science.—MEDICAL ECONOMICS IN MEDICAL SCHOOLS: Medical colleges today have a greater responsibility than used to be the case when most students learned the practical or business side of medicine under preceptors. If division of fees, contract practice, commissions from druggists, and sly methods of advertising are harmful to individuals and to the profession as a whole, why not so instruct students? Not a dozen colleges teach their students the value of medical societies and the rules of correct conduct toward their confreres and their patients. Better more knowledge of that which will make for a higher morale, more ethical practice and for true success.—DARK DAYS AND PHYSICAL AND MENTAL DEPRESSION: During weather that has ruled in December and January there is an increase in catarrhal diseases of the respiratory tract. Bacterial propagation is enhanced and resistive vitality lowered. Mental conditions are also changed, suicides increasing. The association of suicide with homicide is also noteworthy. During such weather physicians and nurses should be awakened to the greater responsibility of guarding against such accidents among their charges.—THE CAUSE OF SYPHILIS: With very few exceptions the findings of Schaudinn and Hoffmann regarding the *Spirocheta pallida* have been confirmed, more than 400 papers now being on record. It seems reasonably certain that the cause of syphilis has at last been discovered. Though at present not much dwelt upon, it seems certain that great practical benefit must result therefrom.—NATIONAL VS. STATE PURE FOOD LAWS: The national pure food act carries with it a negative danger that is not inconsiderable. It in no way interferes with a purveyor of adulterated foodstuffs in any particular State, provided such foods are made in that State. State pure food laws are needed to insure the absence of adulterated food from the markets.—THE CAUSE OF THE REDUCTION IN THE DEATHRATE FROM TUBERCULOSIS: Newsholme's elaborated study of this question is worthy of most careful

attention. His conclusion that institutional segregation of the disease is the only factor directly associated with the decrease, appears to possess a sound basis. This would seem to lend itself readily to experimental verification, certain localities probably being well adapted to the study of the question.—NONINFECTIOUS DUST AND ITS DANGERS: A recent report of the Metal Polisher's Union of North America shows that pulmonary tuberculosis is specially prevalent among its members who work exclusively in polishing precious metals. This emphasizes again the dangerous properties of dust and the necessity of avoiding it in the streets and in houses. If the crusade against tuberculosis is to be successful, there must go hand in hand with it the crusade against dust and dirt.—CARROLL'S PROMOTION AND THE NOBEL PRIZE: A bill before Congress to make Dr. Carroll an extra lieutenant-colonel would provide a suitable reward for what was one of the most unselfish acts of our time. A greater reason for hoping the bill will pass is that this would give great impetus to the movement for securing him the Nobel prize: There appears no good reason why this prize should not be awarded to Dr. Carroll.—THE INTERPRETATION OF MEDICAL LABORATORY FINDINGS: It is unfortunate that all practising physicians have not had a laboratory training, for the lack of it tends to make them put an erroneous valuation on the findings of the microscopist. A point on which many go astray is the significance of negative findings. Laboratory findings must always be correlated with clinical findings and negative findings in diseases of bacterial origin do not exclude the disease suspected.—A LAYMAN'S APPEAL FOR THE SUPPRESSION OF QUACKERY: The most hopeful feature of the present movement against quackery is that it has originated and been carried on very largely by the public. The Kansas City *Independent* in a vigorous editorial emphasizes the necessity of State and national legislation against this practice. Editor Creel frankly says: "The root of the evil lies with the newspapers."—GROCCO'S SIGN: This sign of pleural effusion, namely, a paravertebral triangle of dulness on the side opposite to that of the effusion, is apparently a valuable one because it is rarely absent when there is an effusion of any amount. It may be caused by as little as 250 cc. of fluid. The sign deserves wider recognition than it has received.—MONSTROSITIES IN COMBINATIONS OF DIGESTIVE FERMENTS: The Council on Pharmacy and Chemistry has refused to approve any liquid preparation said

to contain both pancreatin and pepsin. That such preparations are on the market and are used is remarkable. Manufacturers who know better than to combine them blame physicians, saying they put out such monstrosities to supply a demand. Even the national formulary contains a formula for such a preparation. Professor Sollmann is to contribute several short articles on this subject of digestive ferments.—**DR. M'CORMACK'S WORK:** There is a widespread misconception of Dr. M'Cormack's work, even among the friends of the Association. He is not organizing societies or building up the American Medical Association except incidentally. His work is altruistic in bringing the people and physicians into better understanding with each other and enabling each to work for the good of the others as well as themselves. The people want accurate information and are willing to aid.—**GRADUATE WORK IN EUROPE FOR THE AVERAGE AMERICAN PHYSICIAN:** There is a tendency for American medical graduates to go abroad immediately after graduation but in the majority of instances this is not profitable. For those who feel that advanced work is necessary, the large medical centers of this country are infinitely more valuable. After a year or two of practice is the time to go abroad if at all.

**Boston Medical and Surgical Journal.**—**AMATEUR OPERATING:** Cases of infection following operation performed with the help of general practitioners emphasizes the fact that surgeons should have the aid of trained assistants. In addition to preserving asepsis, team work is essential for modern surgery. Consideration of this subject is necessary because of two lamentable conventions. One often maintained by the general practitioner is that he is privileged to help operate on his own patient; the other inheres in the fear of surgeons that they may slight or offend their medical consultants.—**MODERN PSYCHOLOGY:** "We must confess that thus far the fruits of the modern psychology have not been proportionate to the wide range of subjects chosen and the zeal displayed in their investigation; it would seem now to remain for some scientific geniuses to educe important truths from the vast mass of statistical and experimental material which has been accumulated. But we must be patient; modern psychology is still a very youthful science and geniuses are very rare, painfully rare."—**THE TREATMENT OF CANCER WITH TRYPANROTH:** Injections of this material are painful but a few remarkable improvements during its use are interesting and it is possible that we have a

new and curious drug with which to experiment. In apparently hopeless cases it is sometimes justifiable to try methods lacking entirely satisfactory credentials. Results so few in number must be received with skepticism but let no man say that hope shall not spring eternal.—**OPERATIONS ON THE CENTRAL NERVOUS SYSTEM:** Careful reading of the papers on this subject presented at the recent meeting of the British Medical Association arouses a feeling of great hopefulness for the future of this branch of surgery. Progress must be attained through specialism, many cases being necessary for one man if he becomes sufficiently skilled in technic. Horsley's accomplishments should be a stimulus to surgeons in all parts of the world.—**EXPERIMENTAL ANEMIAS:** Bunting, by injecting vegetable poisons, has produced in rabbits changes in the blood and marrow almost identical with those in human beings suffering from pernicious anemia. This would indicate that toxins are the underlying cause of this anemia, though Herter's hypothesis that toxic putrefactive processes in the intestine started by gas-forming bacillus are the source, cannot yet be fully accepted.—**LECTURES ON THE PROBLEMS OF INSANITY:** The institution of such a course of lectures by the New York Psychiatric Society is a wise move. The public lectures in the Harvard Medical School do not touch upon insanity. One or several lectures might well be given to remove prejudice against hospitals for the insane and to emphasize the many analogies between mental and physical disease.—**THE CAUSE OF PORTAL OBSTRUCTION IN CIRRHOSIS OF THE LIVER:** Contraction of the fibrous tissue in the liver has until recently without question been accepted as the cause of portal obstruction in cirrhosis. Herrick concludes from his experiments that obstruction is due to changes in circulation brought about by arterial pressure abnormally influencing portal pressure, thus leading to overdilatation of the latter system.

**Medical Record.**—**THE LONGEVITY OF COLLEGE ATHLETES:** The athletic records of Yale, compiled by Dr. Anderson of the gymnasium, show that 12.9 percent of the general graduates have died, while but 7.2 percent of the athletes who were on either the crew, baseball, football, or track teams have succumbed. Dr. Anderson's paper is temperate in tone but regards as an inevitable conclusion that the Yale man who won high honors in major sports during the past half century has more than the ordinary man's share of long life. He admits that it is still to decide whether this is due to

the training itself or to the original strength of the man irrespective of training.—**FETAL MALFORMATIONS:** Cooke's claim that there exists a relation between the amount of the liquor amnii and fetal deformities possesses a number of points still unaccounted for. His assertion that five of seven cases were foretold before birth is interesting from a prognostic standpoint. Considering the fact that nothing can be done to correct the condition it may be as well for the physician to guard very closely his knowledge on this subject as no doubt it would prove unwelcome to the prospective parents and their kin.—**ADVANCED THERAPEUTICS IN A GOVERNOR'S MESSAGE:** Governor Deneen, of Illinois, has devoted a larger portion to medical matters than is customary in such documents. Particular attention is given to hydrotherapy in the treatment of hopeful cases of insanity. American medical schools should establish chairs of hydrotherapy and teach its principles. The example of Columbia University should be emulated in this respect.—**THE NAVAL MEDICAL SERVICE:** There are always many vacancies in this corps which cannot be filled. In addition to the disadvantages inseparable from the necessary sea duty, promotion except to the lower grades is practically at a standstill. Promotion should be more rapid than in the army or Marine-Hospital Service and the pay should be greater. It is only by offering greater inducements that sufficient numbers to fill the ranks can be secured.—**THE PUBLIC HEALTH DEFENSE LEAGUE:** A bill for incorporating a national society with this title has been introduced into the New York Legislature. Its objects include the prevention of quackery, food adulteration, injurious advertising, and to assist in every way the preservation of health and morals. The possibilities for good of a society of this kind are incalculable and it will deserve the hearty support of the medical profession of the country. As essentially a lay organization the league can do more than the medical profession in keeping down medical parasites.—**FORMIC ACID IN DIPHTHERIA:** The results in Croom's 100 cases seem to bear out the experimental deduction that formic acid is of value in diphtheria. The deathrate from cardiac failure was apparently reduced from 8.6 percent to 2 percent and only 3 percent developed paralysis. It appears quite safe to conclude that in formic acid we have a remedy worthy of a more extended trial.

**New York Medical Journal.**—**TUBERCULOUS DISEASE IN CATTLE:** The conviction is certainly gaining ground that tuberculous pulmon-

ary disease in the human subject is not so often incurred by inhaling tubercle bacilli as by taking them into the intestinal canal. Prohibiting expectoration in public places must be placed secondary in importance to the close inspection of animals intended for food. The theory of aerial infection must not of course be disregarded but due note must be taken of the possibility of infection by the alimentary canal.—**SKILLED NURSING FOR PERSONS OF SMALL MEANS:** Physicians and other professional men give their services ungrudgingly to the poor and we never have doubted that the noble profession of nursing ranges itself on this plane. Nurses need not fear their ordinary fees will suffer reduction if they make occasional remission for good cause.—**THE OPTIMISM OF THE TUBERCULOUS:** Owing to changes in recent years a large number, perhaps the majority, of tuberculous subjects presenting themselves to physicians are in the incipient or moderately advanced stage of the disease. Consequently the fatuous optimism so common to the last stages has in a great measure disappeared as the laity has come to know more of the disease. This loss of the optimism of ignorance is small compared with the positive gain in hope of recovery resulting from the understanding of the nature of the disease and the effect of cooperation in treatment.—**THE SURGICAL TREATMENT OF CEREBRAL BIRTH PALSIES:** Newer attempts in neurological surgery are not free from technical faults but they mark a decided advance in the relief of paralytic nervous diseases. The extension of surgery to the relief of spastic palsies induced by meningeal hemorrhages at birth should be carefully considered as some of the cases yield fairly satisfactory results. The subject should interest equally the obstetrician, the neurologist and the surgeon.—**COORDINATION OF RESEARCH IN EPILEPSY:** The admirable coordination of scientific work of State hospitals for the insane in a central laboratory school is not destined to end in that branch of medicine. Plans are under way to make research work in epilepsy more effective. To give this a proper staying quality there should be a central laboratory school to teach the fundamentals to the colony assistants. This preferably should be in one of the large cities within easy access of libraries and clinics.—**THE CAMPAIGN AGAINST TUBERCULOUS DISEASE:** A committee in New York has decided to issue once a week to various publications circulars setting forth facts regarding tuberculosis and its prevention, the idea being that they will be published in whole or in part. The

plan is highly commendable, the first circular containing a great deal of information valuable to the public.—**THE EARLY DIAGNOSIS OF TYPHOID FEVER:** Conradi has recently called attention to the availability of the ordinary Widal agglutination tubes for his method of early diagnosing typhoid fever by the aid of bile. In 60 cases of the disease the diagnosis was made during the first week in 40 percent and he believes that a larger quantity of blood at least 50 percent could be thus determined. It appears that a distinct advance has been made in the early diagnosis of typhoid fever.—**THE PSEUDOPSYCHOLOGY OF CONTEMPORARY FICTION:** Real psychologists must be indignant at the so-called psychology that is being put forth by sensational writers of fiction. Sexual perversion seems to be the only theme nasty enough to hold the attention of many readers. No country is free from these devilish productions and they are in a way supported by physicians who attempt to follow Krafft-Ebing's classic work. It is to be hoped that medical men with a tendency to write on such subjects will restrain themselves. Such books tend to undermine a normal disposition to sexual morality.—**CHLORIDEMIA IN BRIGHT'S DISEASE:** Whether the recent illuminating work on the significance of the chlorids in the body renders the term chloridemia better than the old term uremia does not yet appear; that it is founded on a more definite basis in accurate observation cannot be denied. The effect of dechloridation upon the phenomena of a uremic attack speaks strongly of the significance of diminution of chlorids in diseases in which the kidney eliminates them deficiently. In the treatment of Bright's disease more attention must be given to the known factors of physiology, as osmotic tension, than to the misty teachings of nitrogenous autointoxication.—**AN ADMIRABLE NORTH CAROLINA INSTITUTION:** Much good has been done by certain schools for colored people in the south. The industrial school at Winston-Salem is now endeavoring to raise \$12,000 to equal a similar amount as a gift. The school should be of interest to medical men because it is to train colored girls as nurses to serve in families of moderate means, not to compete with highly trained graduates of large hospitals.

**Eucalyptus Oil for Leprosy.**—Beneficial results are reported at the leper settlement of Molokai through the use of a preparation of eucalyptus oil for the treatment of leprosy.

## NEWS AND NOTES.

**High Tribute to Dr. Carroll.**—The Senate Committee on Military Affairs proposed to confer an unusual honor upon Lieutenant James Carroll, famous because of his work on yellow fever. He is at present curator of the Army Medical Museum and Laboratory Surgeon in the Surgeon-General's office. The committee had under consideration a bill promoting him to Lieutenant Colonel on the retired list. The War Department reported that Dr. Carroll was a far too valuable man to be retired, and decided that he be promoted to be a Major on the active list of the army. In this form the bill was reported to the Senate. Dr. Carroll was a member of the commission sent to Cuba in 1900 to investigate the yellow fever situation, and he offered himself for experiment to determine the theory of mosquito transmission of the yellow fever germ. He was the first of the volunteers to take the fever, and his was the first case of experimental yellow fever. It was proposed to retire him on account of the malady, but the War Department would not approve the plan. When promoted he will be assigned to the Medical Corps of the army. He is 52 years old.

**Solar Heat in Surgery.**—Observing in the tropics how the intense heat of the sun accelerated the healing of wounds and burns, a French physician, Dr. Asbeck, used the heat of ordinary fire in 500 cases of burns and wounds, after putting on the usual dressing, and with uniform success.

**Medical Honors for Book Publishers.**—The medical faculty of the University of Tübingen, Germany, has conferred an honorary degree of doctor of medicine on F. Enke, of Stuttgart, for his fine medical publications. This same honor was conferred on Gustav Fischer, of Jena, a few years ago. Each of these publishers not only publishes medical books, but also issues one or more high-class medical periodicals.

**War on Cocain.**—The New York State Board of Pharmacy has joined in the war upon the indiscriminate sale and use of cocain. The board has taken steps looking to legislation prohibiting the sale of the drug, except upon a physician's prescription. It is said the measure will be drastic enough to reach many so-called catarrh remedies.

**For Pure Embalming Fluid.**—The controversy as to the cause of the death of William Marsh Rice, the aged New York millionaire,

of whose alleged murder Albert T. Patrick was convicted, has resulted in the adoption by the New York State Board of Embalmer Examiners of regulations designed to prevent the use of any embalming fluid containing poisons which might embarrass the detection of crime. These regulations have been approved by the State Health Department, and have the force of law. They prohibit the use or sale in this State of any fluid containing arsenic, zinc, mercury, lead, silver, antimony, chloral, or any poisonous alkaloid, or that is not a thorough disinfectant in the proportions ordinarily used in embalming.

**Testing Opsonic Method.**—Physicians at the Rockefeller Institute, New York, have been experimenting with the opsonic theory for the cure of infectious diseases, including tuberculosis. This method is founded on the theory that there is in each person's blood the organic substance which will counteract the bacteria which occasion the disease. The Department of Health has taken up the application of the experimental work in the treatment of tuberculosis.

**Hospital Asks Aid.**—The annual report of the New York Society for the Relief of the Ruptured and Crippled shows that 920 patients were treated in the hospital during the past year and that 46,284 treatments were given in the outpatient department. Although a saving of over \$8,000 was made as compared with the previous year, the expenditures still exceeded the receipts by more than \$27,000. On account of this deficit an appeal for public subscriptions has been made. This hospital is the largest orthopedic hospital in the world.

**Bacteria in Milk Bottles.**—The host of bacteria that may lurk in a supposedly clean milk bottle has been the subject of investigation by the Wisconsin Experiment Station. Bottles which had been steamed for 30 seconds were found to contain relatively few bacteria, possibly 15,000 to a bottle. However, when the steam was allowed to condense and the water so produced to remain in the bottle at room temperatures for possibly 24 hours, the number of bacteria multiplied enormously and varied from 2,000,000 to say 4,000,000. In a series of steamed bottles exposed to the air for 24 hours, but containing no condensed water, the number of bacteria averaged 300,000 per bottle, while in a similar series which had undergone the same treatment in all respects except they were covered with a clean linen cloth, averaged about the same as freshly-steamed bottles, all of which shows the very great importance

of keeping milk bottles, either empty or full, very carefully covered.

**Rural Doctors Combine.**—The physicians of Elmer, New Jersey, have combined to regulate rates for visits and furnishing medicine, night visits to be charged at double rates. When medicine is left for more than one member of the family extra charge is also to be made. Local visits are to be \$1, but over three miles it is to be \$1.25, and further than that is to be \$1.50.

**The Low French Birth-rate.**—One of the first acts of the new Minister of Labor, M. Rene Viviani, was to publish a digest of the statistics sent in by registrars concerning the births and deaths of last year. The figures show that the excess of births over deaths in France is decreasing yearly. The annual average for the last decade is 50,971, but the excess last year was only 37,120. The rate of the excess of births over deaths is 19 per 10,000 of the population, whereas in Great Britain it is over 100 and in Germany 148. M. Viviani's report also shows that the deathrate is higher than it has been for three years. In 44 departments out of 86 the number of deaths actually exceeds the number of births. The thickly populated industrial districts show a sharp decline in the birth-rate, and in the Department of the Seine, practically speaking, Greater Paris, there were 2,944 fewer births than in 1904, although the population of the department is steadily increasing.

**Spectacles for Railway Men.**—If the wishes of the railway surgeons of America, as expressed at their annual meeting, are heeded by the railway companies, engineers and firemen experienced in the service will no longer be discharged for defective eyesight, but will be allowed to wear glasses and hold their positions.

**Eyesight Test for German Railroad Employees.**—Employees of the railroads in Prussia must have their eyesight tested when they enter the service, again when they enter on another branch of work which makes greater demands on the eyesight, and again when appointed to any official position. Beside this, the eyesight must be tested anew every five years, at which time the men are also to be examined for ocular and constitutional affections, and also for injuries to the head. In certain branches of the service the employees are allowed to wear glasses to bring their vision to the proper standard, but artificial aids are not permitted to switchmen and bridge-tenders, signal men, locomotive engineers and stokers, conductors or dispatchers.

**Famine and Pestilence in China.**—The foreign relief committee at Shanghai reports that smallpox has broken out in the camp for famine sufferers at Tsingkiangpu, and that on this account the officials have broken up the camp, which had several hundred thousand inmates. The efforts to cope with the situation are said to be hopelessly inadequate, and immense loss of life is expected. The institution of relief work is greatly hampered by the lack of means of communication, and the fact that the wealthy are deterred from making large contributions through the fear of political speculation.

**The Pennsylvania Railroad management** has decided to change the age limit at which men may enter the employ of the company from 35 to 40 years. In the West, the Pennsylvania Company has had difficulty in securing competent men under the age limit.

**Gift to Pasteur Institute.**—Daniel Osiris, the philanthropist, is dead. He bequeathed \$5,000,000 to the Pasteur Institute.

**Karlsbad Springs Menaced.**—The famous springs at Karlsbad, in Bohemia, are said to be threatened, as a result of mining operations which are being conducted in the neighborhood. A commission which was appointed to examine into the matter and report on the effect of these mining operations on the springs has declared that the operations should come to an end. Geologists have now been called on to give expert opinion.

**Plague Again in Australia.**—There is a recrudescence at Sydney of the bubonic plague, which broke out first in February, 1905, and reappeared in March, 1906. Eleven cases, two of which were fatal, have been reported since January 25.

**New Jersey's Vital Statistics.**—The number of deaths reported to the New Jersey Bureau of Vital Statistics in January was 3,289, an increase of 1,019 over the number for the previous month. There were 486 deaths among infants under one year, 202 deaths of children under five years, and 770 deaths of persons aged 60 years and older. Compared with the preceding month, the reports show an increase of 59 deaths from pulmonary tuberculosis; pneumonia shows an increase of 105, and other diseases of the respiratory system an increase of 64. Forty-five deaths from typhoid fever show a slight diminution compared with the two previous months. The mortality from scarlet fever—11—is but slightly greater than the average for the six preceding months, which was 9.35. Diphtheria caused 80 deaths, while the average for the previous six months was only

45.33. Diseases of the nervous system caused 100 more deaths than in the month of December, and 88 more than the average for the six months from July to December, 1906. Bright's disease is charged with 200 deaths, which is 41 more than the number for December.

**No Surgery for Assault.**—Surgical punishment for attempted criminal assault, in addition to 20 years' imprisonment and 60 lashes, a punishment proposed in a House measure in Delaware, was killed in the Senate after almost unanimously passing the House last week.

**Meningitis Raging in England.**—Cerebrospinal meningitis, hitherto but slightly known in the British Isles, has broken out in virulent form in Scotland and the north of Ireland. The disease has almost become epidemic in Glasgow, where 103 cases occurred in January, of which 47 were fatal.

**More Insanity in New York.**—A steady increase of insanity in New York is reported by the State Commission in Lunacy, in its eighteenth annual report. The net increase for the last year of cases in all institutions was 895. In the State hospitals alone it was 839. The whole number of new cases developed in the year was 5,761, slightly more than in the preceding year. The total of insane in all institutions at the close of the year was 28,302, of whom 960 were classed as criminals, 1,468 were discharged as recovered, 1,142 improved sufficiently to permit them to live permanently in the community, and 74, temporarily detained, were discharged. An immediate appropriation is asked for a site for a new hospital to replace that on Ward's Island, as the State's lease of that island expires six years hence. The report favors especially the extension of the plan of farm colonies in connection with the existing hospitals.

**Additions to the New York Sanitary Code.**—The Board of Health has added two important sections to the Sanitary Code, the first prohibiting the sale of cocaine alone or in combination at retail by any person in the city of New York, except upon the prescription of a physician, and the second requiring all persons to wash all milk or cream receptacles, such as bottles or cans, immediately upon emptying them.

**The olive oil** imported from Italy and other European countries has practically all been found pure so far as examined by Dr. Wiley, of the Department of Agriculture.

**Ear drums** made of thin leaves of silver are being used in the Russian military hospitals for diseases of the ear, to replace defective organs.

# American Medicine<sup>129</sup>

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**Medical and surgical fees** are discussed in *World's Work* in an entirely novel way which demands attention. It is charged that the high fees of the noted man make it impossible for any but the rich to secure his services—unless it be a hospital pauper. The great middle class of the community—the real people—must be content to receive aid from the less noted. It is charged that this class of society might be of more value than either the pauper or millionaire and yet they must run the greater surgical risks, assuming that the noted surgeons are really the best, which is an unwarranted assumption by-the-way. It is also said that these conditions therefore violate medical ethics, as the profession does not render the best social service, that commercialism is running away with ethics and that there is no doubt that big fees are undermining the character of the profession. These would be serious charges if they were not fallacious.

**A man worthy of his hire** and good ethics demands that no man sacrifice himself for others as a rule. There may be occasions when men must offer up their very lives for society, but if all are to be injured in their daily work society itself suffers. If *World's Work* is correct, then the noted clergy and lawyers are inethical in demanding bigger pay than the average man, and the mass of society are wrongfully barred from the best theological instruction and the best legal advice. The

writer of the charges would be very indignant if he could not hire doctors for his family because they were all busy with poorer folks. Fees obey the law of supply and demand, though both clergy and physicians do all the good they can if it is not injurious to themselves or their families. Charity has limits and it begins at home. If utilizing one's talents to their greatest for the benefit of one's wife and children is bad ethics and commercialism as the *World's Work* charges, then the whole world is out of joint.

**Mutual aid** is the basis of true ethics, and is the foundation of the survival of all living species—none of which can exist unless they render assistance to others. The whole profession of medicine would vanish if its members were not aided while they are aiding others. It is curious that there should be such wide difference of opinion as to the legal and medical profession, one expected to be purely selfish and the other wholly altruistic. The great lawyer is not thought to be inethical if he refuses to help a poor beggar fighting for his life, but the doctor is. The one demands a retainer fee or will not work at all, the other must work with or without pay. Both views are wrong, for both professions do much work without pay and in each the best talents are the most sought for and highest paid. Medical aid is no more a natural right than legal aid nor theological, either, for that matter.

**The value of a telephone call** is becoming an important matter in the ordinary practice of medicine. In the old days sick people were content to see the doctor once a day, or perhaps less frequently in country practice. They are more exacting now and find it is an easy matter to reach over to the phone at night, call the doctor out of the sound sleep which he so sadly needs after a hard day's work, and then ask a silly question. Such a call is more of a drain on a tired man's vitality than is supposed. It should be considered the most valuable service possible and paid for at appropriate rates. There is a story told of a prominent specialist who removed the telephone from his house, because he was called at 3 a. m. by a patient who inquired whether his engagement was for 10 or 10:30 the next morning. The general practitioner cannot do without his phone, and he can avoid abuses merely by charging full value for such service.

**Alcohol is not the cause of alcoholism** is the conclusion to be drawn from some of the recent discussions on this much vexed subject. The condition is said to be a form of insanity and in its periodicity it resembles epilepsy, of which perhaps it is an equivalent. The "drink storm" can actually be predicted, so regular is its appearance. It seems as though the sufferer's daily method of living—perhaps even as a total abstainer—takes just so much time to fatigue the nervous system into a sleepless painful condition of great agony in which it demands a narcotic, and experience teaches just how much alcohol is needed for the purpose. After a certain period of this drugged sleep, the nervous system is able to do its work for another term. The sufferers are invariably of neurotic ancestry and generally show symptoms of nervous defects. They are of

every grade of intelligence, from the stupid laborer to the man of genius and from the idler to the busy man of affairs.

**The real cause of alcoholism must be found** if it is not due to alcohol. All the temperance agitation and prohibition in the world will not stop the production of potential drunkards, if the real causes are not removed. After the condition exists it is permanent as a rule and the afflicted one will take other drugs if he cannot get alcohol—supposing that there is a spot in the civilized world where liquor is not obtainable. The damage done by this abuse of alcohol is so great that we must find a means of combatting it. It does seem that our specialists are carrying us to extremes and that alcohol is a factor in the production of the chronic nervous condition which demands narcosis. The sufferers begin excesses usually before twenty years of age, but that does not indicate that they are necessarily doomed. Perhaps they might grow into nervous stability in a few years, if placed in a proper environment.

**The damage done by the early drinking** surely multiplies the original nervous fault. Yet as so many young men drink to excess—perhaps most of them—and as so few of them continue it after they get sense, it is quite evident that alcohol of itself, even when thus abused, has not done enough damage to result in the permanent condition. The healthy young man is immune. If he were not, some of our colleges would graduate an appalling percentage of chronic drunkards. The lesson to be derived is self-evident. If the physician recognizes the boy's tendency to periodicity, he must recommend that studies be stopped and the exhausted nervous system be built up by nourishing food and a year of outdoor life

at easy labor which does not give much idle time. Even if it should be proved that the alcohol is not the main cause of alcoholic thirst, it is safe to presume that it is a factor, and that we should continue the present crusade for total abstinence in youth and early manhood.

**The postponement of fatigue** has been discussed by Dr. Chas. Féré (*Revue Scientifique*, September 15, 1906) and the title is badly chosen, for if there is any one thing which we should not do, it is to postpone the sensation of fatigue—nature's danger signal and cry for rest. What Féré really discusses is the manner of doing work with the least expenditure, and the proper ways of resting for recuperation. It is an exceedingly important matter, which American business men would do well to study, to postpone the chronic neurasthenia which is the unhappy fate of so many of them. Anything taken to deaden fatigue and hide exhaustion, so that work can be continued, is the height of folly. Alcohol is usually taken, as it is almost a specific from its narcotic powers, so that we have yet more of the gathering mass of material as to the abuse of what many consider a valuable drug. Alcoholism and fatigue are inseparable. The agony of alcoholics in a "drink storm" is, perhaps, after all, merely a magnified painful sense of fatigue.

**The real effects of alcohol** in small and large amounts are not known to any greater degree than fifty years ago. The subject was brought up several times at the recent meeting of the British Medical Association, and the opinions expressed were so contradictory as to destroy each other. The alleged experts and specialists have produced a scientific scandal as bad as the war of experts in our malodorous court trials.

The speakers were honest and far above average intelligence, and yet they came to opposite opinions. It is evident that they did not have sufficient facts to reason upon, or indeed they may have had no facts at all. It is really disgraceful to hear one scientist say that alcohol is a food, and another deny it—and then squabble over the definition of a food. One therapist asserts that alcohol when properly used is a blessing in disease and another says it is always a curse. One says it is always depressant, and another that it is stimulating and supporting in the right doses. One forbids it in weak hearts and the other always gives it as he knows it saves lives. Then there are positive misstatements. This whole subject is one of medicine's scandals, and the profession owes it to itself to learn only facts and publish only facts, and then come to a unanimous opinion. In no other branch of medicine are there so many baseless opinions.

**The International Antialcohol Congress** meets regularly in Europe, and the reports of its proceedings are painful reading to one who wants to know the truth as to the effects of alcohol. Everything said against alcohol seemed to be well received, but anything in its favor met with a howling storm of protest. It was not an intellectual scientific affair, but an emotional ethical congress of those who know the evils of alcohol but do not know how to stop them, except by total abstinence. We regret to see full reports of these congresses in a scientific medical journal, for they do nothing but impede the present efforts of a few investigators to learn the real truth. The scientific work must be entirely divorced from the total abstinence propaganda or any other nonscientific purpose. It has been so cursed by fanaticism—even in the colleges

—that opinions on the subject are without the slightest value, and real scientific opinions are shamefully garbled. An open letter in *The Century Magazine* for November, 1905, stated that *American Medicine* said "that the majority of physicians do not now prescribe alcoholic liquors," yet *American Medicine* has never said anything of the kind.

**The incurability of the inebriate** is the sorrowful conclusion to which one comes after reading the report of Dr. Gill, Medical Superintendent of the Lancashire Inebriates' Reformatory, extracts of which appear in *The British Medical Journal*, of April 14, 1906. He says that mental recoveries in a considerable number never go beyond a certain point and he classes nearly 50 per cent of his patients as higher grade imbeciles while many others are weak minded and unable to work—perhaps congenital neurasthenics. Even in the smaller number classed as normal men, the mental recovery is very slow, so that the advertised methods of quick cure are fallacious. This report should produce a profound impression on the medical profession and the public, too, for notwithstanding the fact that men of great or average intelligence might be afflicted, most of our inebriates are congenital defectives—even the drunken genius is a warped mental specimen. The inebriety is a result of their condition and not a cause. How dishonest, then, it is, to hold out the promise of cure, as many of the sanatoriums do! The present trend of thought among law makers is in the direction of the confinement of inebriates for life, and it seems to be founded on sound pathologic findings.

**The cause of fatigue** has been extensively studied and by fatigue is meant the painful feelings accompanying exhaustion. Certain experiments seem to indicate that

the sensations are due to toxic substances which collect during work and are eliminated during rest. Injected into rested animals, these toxins produce all the evidences of exhaustion, even causing death. These recently discovered facts throw a new light on the subject of exhaustion and its results. Arteriosclerosis, for instance, is a disease due to overexertion and also one due to various poisons, so that perhaps the condition in laborers is really a result of poisoning. It is one of the best known facts in medicine, that hard work, if not excessive, and if it is properly intermitted for rest, is the best means of keeping the body and mind in health. The new facts merely emphasize the other side—that is, that the strenuous life of overexertion with insufficient rest is the cause of incurable exhaustion, premature senility and shortened life.

**Mendel's law** is occupying so much of the attention of the biological world, that it has become necessary for physicians to know what it is and also its application to the heredity of normal and abnormal characteristics in man. In every species in which it has been tested, either plants or animals, it has been found to operate, in some characters, yet on account of the persistence of the false idea that man is an exception to natural law, a few naturalists have foolishly denied that it applies to him. It does apply to him as rigidly as to any other animal and the evidence is in the possession of every family doctor in the land.

**Mendel was a priest**, but being an amateur botanist, his wonderful discovery was treated with supercilious contempt by the professional botanists until they discovered it themselves, and the progress of biology was thus delayed for thirty-five years—the old, old story of the manner in which the

orthodox professionals almost invariably retard the progress of their own sciences, and they are at the same nefarious business now in refusing to accept the wealth of evidence of the harmfulness of eyestrain, of excessive light, etc. Mendel had a huge brain and wonderful powers of observation, so he soon detected the fact that when certain varieties of plants were crossed to form hybrids and these were interbred, the individuals of the third generation seemed to differ from each other according to some rule and he at once started to find out what that rule was. He found it! He did not cry "Eureka," but modestly published the facts—and they were forgotten. This was in 1865, but the stone which was then rejected has become the head of the corner. It has revolutionized our theories of heredity.

**The basis of Mendel's law** is the fact that when we cross two varieties of a plant which differ from each other in only one character, say length of stem of peas, the resulting "hybrids," as a rule, are not intermediate between the parents. One of the types is so preponderant in the hybrid that the other can be detected with difficulty if at all. In the above illustration, the hybrids have long stems. The evident character, length of stem, is called "dominate" and the latent or disappearing one, shortness of stem, is called "recessive."

**When hybrids were interbred** or self-fertilized, Mendel found a most remarkable fact—the latent or recessive character (short stem) reappeared in one-fourth of the grandchildren, and these subsequently bred true to this type. In the other three-fourths of the grandchildren, the dominant character (long stem) appeared, and they all resembled their hybrid parent, yet when interbred, one-third of the offspring—the great-grandchild-

dren—were of the long stem or 'dominant type and remained so in subsequent generations, while two-thirds were real hybrids like the second generation. That is, hybrids produce seeds, one-half of which develop hybrids, one-fourth are true to one type and one-fourth to the other. There were exceptions, in the case of striking characters, in which the hybrid assumed a mean or intermediate form between the two parents, but the rule is as described. Mendel's process then is not universal.

**The explanation of Mendel's law** is very simple if we accept the theory that each character is independently present in the hybrid, and does not always blend with the other. It is also assumed that both the opposite characters, longness and shortness of stem for instance, could not exist in the same germ cells of the hybrid. Consequently there are two kinds of germ cells in each male hybrid and each female. The conjugations occur by the ordinary mathematical "laws of chance or probability" which explain the relative numbers of the resulting forms. The revolution in our views of heredity is in this evidence that opposite characters of parents are not necessarily blended in the children as we once believed, but may exist independently in them either evident or latent. Consequently, in one or more respects, some of the grandchildren may resemble a grandparent but not the parents. It explains atavism and also proves that evolution of the new species is not generally due to crossing, for Mendelian hybrids disappear by breaking up into the parent types in subsequent generations.

**When the parents differ by many characters**, the combinations in the germ cells of the hybrids, by the "laws of chance,"

are exceedingly complicated and the formulas explaining the results are too complex for anyone to understand except a trained mathematician. It would be exceedingly rare for all the characters of one type to happen to combine in one of the grandchildren or later offspring (Professor W. E. Castle, *Pop. Sc. Mo.*, July, 1905) and yet it is possible, and does occur approximately. For these reasons we have failed to notice the Mendelian process in man, where the differences between the parents are so numerous. Nevertheless there is a growing impression that a study of individual differences of parents will bring out many facts in accordance with the law, which applies to functional and mental characters as well as physical.

**Blended inheritance in man** is common enough to have given the impression that Mendelian transmission is the exception and confined to such abnormal conditions as hypophylangia, alkaptonuria, which is said to be recessive, albinism, polydactylism, deafmutism, color-blindness, hemophilia, some forms of cataract, eye color, texture and color of the hair and a few others. (G. Archdall Reid, *Principles of Heredity*.) Alternation is seen clearly, of course, only where the two types interbred are alike except in one character, yet Castle states that it is not exceptional. Mendel himself seemed to think that only in marked characters was there blending. All the negro characters are generally believed to be blended in mulattoes and impossible of total elimination from subsequent generations no matter how much diluted by white blood. Nevertheless, some cases, as early as the fourth generation, are wonderfully like white types in at least a few characters.

**Both kinds of inheritance in man** were found by Francis Galton long before Men-

del's law was generally known and it is perhaps safe to state that both forms can exist side by side. When the elimination of many marked characters requires very many generations, it is unwise to dogmatize. "The purity of the germ cells" of hybrids is certainly not proved to be universal and has never been claimed to be. Apparently germ cells coalesce sometimes to form a new chemical protoplasm and other times to form a mere mixture.

**Pigmentation is generally a dominant character**, so that hybrids between dark and light types are pigmented, being likened to two superposed pieces of glass, one transparent, through which the dark one is seen. Albinism and blondness, being recessive, crop out at once in experiments with mice and guineapigs. We also frequently see light blond children descended from brunet parents who thus prove to be Mendelian hybrids. If it should happen that the blonds of a family are less resistant to disease, the line becomes brunet in time—a process known to occur in England and America. (Havelock Ellis.) Color of eyes and hair when recessive seems to assert itself sooner than skin color, for we now and then find quadroons with light eyes and hair. Nevertheless, skin pigmentation in man may prove to be a blended character when there are marked differences in the parents, but Mendelian when there are minor differences.

**The inheritance of a tendency to disease** is then a very complex matter, should Mendel's law hold. If one parent is sound the children may not have less susceptibility but be Mendelian hybrids in respect to this one character; that is, all of them might show it in full or not at all according as it is dominant or recessive. Their children

on the other hand would be either wholly free of it like one grandparent or diseased like the other. Cases are known of a latent tendency of one parent thus carrying off three-fourths of his children, say by tuberculosis, while the other fourth were wholly free of susceptibility. Every old physician probably knows of scores of other applications of this pathologic application of Mendel's law. The sins of the father are not necessarily visited upon his children, but upon a few of his grandchildren. A tendency to contract a certain disease may completely disappear from families by the survival of the few who have not inherited it. The immunizing substances in our body fluids or cells seem to be transmitted by Mendel's law. The immunity to tuberculosis so often seen in the children of a tuberculous mother, may not be due to an anti-toxin transmitted by her to the fetus as we are often told, but it may be a Mendelian inheritance from an immune grandparent, but recessive in the mother, or indeed the susceptibility might be really present in these children, recessive and ready to crop out in their children.

**The marriage of defectives and un-stables** is presented in an entirely new light. The abnormality may be dominant and instead of being softened by a vigorous mate, it appears strongly in all the offspring and the family is beyond regeneration. On the other hand the inability may be latent in the children and appear in but few of the grandchildren. Such skipping of a generation is so common as to lead to the belief that Mendelian inheritance is the rule. The effects of Mendel's patient pottering with his flowers are so far-reaching that no physician can afford to be ignorant of the matter and it must be taught to medical students. It is another instance of tremendous

practical good resulting from scientific experiments which had no practical end in view. Professor W. Bateson's book on Mendel's law is interesting reading even if we do not intend to apply it to human pathology.

**The spreading of disease by insects** is now proving to be much more common than was believed to be the case but a year or two ago or even a few months ago. The greatest attention has hitherto been given to those diseases wherein the insect acts the part of a secondary host in whom the parasite undergoes some kind of change not possible in man—malaria, yellow fever, filaria, Texas fever, etc. It is interesting to find increasing attention being given to the possibility of the mechanical transmission of infective organisms from man to man by means of the commoner insects, flies, bedbugs, roaches, and fleas. There is no reasonable doubt that in recent wars flies were responsible for the transfer of typhoid bacilli from open latrines to foods which were not screened. A revolution in the care of the sick necessarily results in private practice as well as in hospitals. It is evident that each infective patient must be carefully protected from flies and other insects, otherwise he is dangerous to every one in the immediate neighborhood.

**The premature deaths of athletes** have again occupied public attention as they should. Another prominent man famed for his wealth, mentality and magnificent physique, has died at the age of 56 when everyone thought he ought to live at least two decades more. College authorities must wake up to the fact that athletic training shortens life as a rule and not as an exception. The damage is done in youth and early man-

hood, at the period when the pliable nervous system is able to force the organism to an amount of strain for which nature has made no provision. The heart enlarges and the arteries thicken to compensate, and the organism is then unfit for long life. Death results from one of the numerous diseases based on a dilated heart, arteriosclerosis, or nervous exhaustion. It is high time that it be considered a crime to submit an immature college boy to those strains, and it is also time to exclude college sports which demand modern pugilistic "training." There must be sport, exercise, athletics and calisthenics but not one of them should cause an unnatural strain on the heart, arteries, or nerves.

**The long life of sedentary workers** has been noted ever since vital statistics have been studied. The matter was once considered somewhat of a joke, but it is now found to be due to a well-defined cause—the organism has never been unduly strained. It is really surprising how health can be maintained by gentle exercises. The strenuous life is not good for the great majority of mankind no matter how much it may be enjoyed by the exceptional man. It is a good sign that these facts are becoming known to the laity who have so long admired the strenuous and muscular laboring man who is unfit for hard work at 55. A little more publicity now and then is in order, and we may confidently look forward to a more sensible training of our boys in college and out of it, too.

**Religious heresy and intelligence** have been most forcibly linked together in a recent church trial—at least in the remarks of the defendant's counsel. This connection is not only of great scientific importance, but strikes a sore spot in the history

of medicine, whose brilliant pioneers have all been subjected to more or less persecution by the less intelligent conservatives. In this church trial, too, it has been noted that the accused divine was incomparably more intelligent than his accusers and judges. It seems to be a law of human nature, that the less intelligent mass hold to that which they were taught, and bitterly resent any change—so bitterly indeed that persecution of the few thinkers follows as a matter of course.

**Heresy trials** are now considered to be monumental blunders and are always regretted afterwards. Both in medicine and theology, famous persecutions, often, if not invariably, have blackened the accusers' reputations and increased that of the accused whose great abilities are thus brought to the world's attention. The present theological issue is as clear cut as all past ones—churches must permit intelligent interpretation of the foolish things said in the dark ages, or drive the thinking men out—to the everlasting injury of religion. The lesson to physicians is as clear as to the clergy. New medical discoveries which reverse old ideas or clothe them differently must not be attacked on the ground of their newness. It only causes contempt to be cast upon the science as a whole. There is a growing restlessness in all churches against restraints on the mind—more so perhaps than previously. Some churches bend to the change, others split in two, but liberalization advances in all. Likewise in medical circles, there seems to be a growing liberality towards newness, though our conservatism is still a blot. There is likewise a growing restlessness against bowing to medical authorities who no longer bind our thoughts like the religion and medicine of a thousand years ago.

## BOOK REVIEWS.

**A Text-Book of Obstetrics.**—By BARTON COOKE  
HIRST, M. D. Fifth Edition. Philadelphia and  
London: W. B. Saunders Company, 1906.

The Fifth Edition of this well-known book needs no extended comment. The text reaches 884 pages and with the numerous illustrations forms a complete exposition of the subject treated. The author states in the preface that in the general revision he has paid particular attention to recent advances in our knowledge of puerperal infection and gestational toxemia. The entire work has been brought thoroughly to date and can be recommended as a convenient and safe guide for the obstetrician.

**The Operating Room and the Patient.**—By  
RUSSELL S. FOWLER, M. D. W. B. Saunders  
Company, Philadelphia and London.

This publication is practically a set of rules and regulations to be observed in the operating room and the parts adjunct thereto; founded upon the usages at the German Hospital, Brooklyn. The author deserves commendation upon its fullness and the attention which he has given to details. It forms an excellent guide to nurses, interns and those practitioners who have to rely upon their own resources for the preparation of surgical dressings and material. The illustrations are good and the publisher's work has been excellently done.

**The Schott Methods of the Treatment of Chronic Diseases of the Heart with an Account of the Nauheim Baths, and of the Therapeutic Exercises.**—By W. BEZLY THORNE, M. D., M. R. C. P. Fifth Edition. Philadelphia, P. Blakiston's Son & Co., 1906.

The fact that Thorne's excellent account of the physiologic methods of treating chronic diseases of the heart inaugurated and developed by the brothers Schott at Bad Nauheim has reached the fifth edition, speaks well both for the book and the medical profession. It has been revised and improved, and we can cordially commend it as an intelligent and useful exposition of its subject than which there is nothing more important in the therapeutics of chronic diseases.

**Abdominal Operations.**—By G. A. MOYMEAN, M. S. (London), F. R. C. S. Second Edition. W. B. Saunders Company, Philadelphia and London.

The early appearance of the second edition has prevented any radical changes that might occur due to any considerable interval of time. The chapters in complications and sequels of abdominal operations, operations for perforating gastric ulcers, gastro-enterostomy, anterior and posterior, operative treatment of cancer of stomach and resection of the liver, have been rewritten and markedly enlarged. The work has been enlarged, particularly in fulness of description, giving about 125 more pages than in

the first edition. The entire book shows the same high quality of the publisher's work as was observed in the first edition.

**The Autotoxicoes, Their Theory, Pathology and Treatment.**—By HEINRICH STERN, New York. G. P. Engelhard & Company, Chicago, 1906.

The author of this book of 200 pages has set forth his views as to the status of the autotoxicoes. His attitude is well shown by the question "What else is the 'autotoxic origin of disease' but unadulterated hypothesis in most instances?" In Part I are considered theoretic, pathologic and critical points, including intestinal and catabolic autointoxications and the pathogenesis of uremia, this review being summarized in 28 conclusions. Part II deals with the therapy of the autointoxications. The various phases of the subject are necessarily briefly dealt with but suggestive and helpful statements render the book of value to the clinician. It will aid in clearing the atmosphere regarding "autointoxication."

**A Nonsurgical Treatise on the Diseases of the Prostate Gland and Adnexa.**—By GEORGE WHITFIELD OVERALL, Chicago. Rowe Publishing Company, 1906.

In the third edition of this book the author devotes special attention to the description of new instruments and methods devised during the past year. These still further add to his resources for treating these conditions without resorting to operation intervention.

**The Embryology, Anatomy, and Histology of the Eye.**—By EARL J. BROWN, M. D. With illustrations made from transverse sections of the human eye enlarged by microphotography. **The Physiology of Vision.**—By WM. D. ZOETHOUT, Ph. D. Hazlitt and Walker, Chicago, 1906.

It is not the declared intention of the authors to set forth any new facts relative to their subjects, but to collect and digest the wellknown but widely scattered literature in a comprehensive form, and to illustrate the text so profusely that it will be interesting and easy of comprehension. Especial attention has been given to Embryology. The excellent illustrations used in these chapters are from serial sections of fetal pigs' eyes, made by Dr. Slonaker, at the University of Chicago, who had the good fortune to be given the wonderful facilities at the Armour packing establishment. The reviewer possesses a set of Dr. Slonaker's slides of serial sections of fetal pigs' eyes, taken from embryos, ranging from 2 to 40 millimeters in length, and can bear witness to the good use Dr. Brown has made of his material. All through the work, the illustrations are preeminently the feature. The reproductions of the photomicrographs are strikingly excellent, and there are many original drawings of the gross structures. Unfortunately, the typography is poor, and there is an abundance of errors in diction and

in spelling, particularly proper names; as for instance, Decemet (p. 85, 86); Bruck (p. 93); Ora Serrata (p. 92); Kraus (p. 78); Swan (p. 110); Rete Mukosum (p. 88), etc.

**A Treatise on the Motor Apparatus of the Eyes.**—Embracing an Exposition of the Anomalies of the Ocular Adjustments and Their Treatments with the Anatomy and Physiology of the Muscles and Their Accessories. By G. T. STEVENS, M. D., Ph. D. Illustrated with 184 engravings, some in colors. Cloth. Pp. 496. Price, \$4.50 net. Philadelphia: F. A. Davis & Co., 1906.

This excellent work is a sequel to the author's wellknown "Functional Nervous Diseases." It opens with a historic treatise of the anomalies of the ocular musculature. There is a thorough description of the anatomy, setting forth the relative facts perhaps more clearly and concisely than in previous works on this subject. The essential physiological doctrines which have been more or less universally accepted are described and discussed. The author's own interpretations upon certain known phenomena are advanced, there is a presentation of some of the older views in a new light. There is set forth a new consideration and systematization of the principles upon which ocular motor anomalies depend, based upon the author's wellknown observation during the last two decades. The volume closes with a comprehensive compilation of the principal facts relating to the paralytic and obstruction affections of the ocular muscles found in ophthalmic literature. Dr. Steven's treatise is a fitting culmination to his many interesting and original labors in this field. The arrangement is excellent, the text lucid, and the illustrations, many of which are original, most illuminating and instructive.

**The Influence of the Menstrual Function on Certain Diseases of the Skin.**—By L. DUNCAN BULKLEY, A. M., M. D. New York and London: Rebman Company, 1906.

In again calling attention to the long-known, but too frequently overlooked facts that many diseases of the skin are but the external manifestation of some internal disorder, Dr. Bulkley has performed a real service to the general practitioner and dermatologist alike, the latter being frequently as much inclined to regard diseases of the skin as purely local affections as the former is to look upon all eruptions as of internal origin. Numerous examples are given of the relationship of gout, rheumatism, insufficient excretion, and nervous disorders to diseases of the skin. It is pointed out how a knowledge of such relationship is of the utmost value, not only in the treatment of cutaneous disorders, but in frequently giving valuable information as to the existence of previously unsuspected internal disease. In the second of these small volumes the author presents a long list of diseases of the skin of the most varied kind, collected from literature and from his own extensive observations, in which a more or less close relationship to the menstrual function is at

times evident. Acne, eczema, herpes, urticaria, erythemas of various kinds are some of the cutaneous disorders most frequently associated with menstruation. The author regards the following as the most plausible of the theories concerning the nature and causes of this relationship: (1) Cyclic changes taking place in the general system; (2) autointoxication of genital origin; (3) nervous reflex irritation from the congested condition of the uterus and ovaries, the first and last of these theories being fairly well founded.

**Transactions of the Association of American Physicians.**—Volume XXI. Twenty-first Session, Washington, D. C., May 15, and 16, 1909.

This volume is an unusually large one, containing 855 pages of matter read at the meeting. In all there are 57 papers. They are of the usual high standard of contributions to this association and consequently the volume is of exceptional value.

**Progressive Medicine.**—Edited by HOBART AMORY HARE, assisted by H. R. M. Landis. Volume II, June, 1906. Lea Brothers and Company, Philadelphia and New York.

This number of Progressive Medicine is as usual well written and well edited. The subjects considered are Hernia, by W. B. Coley; Surgery of the Abdomen, by E. M. Foote; Gynecology, by J. G. Clark; Diseases of the Blood, Diathetic and Metabolic Diseases, Diseases of the Spleen, Thyroid Gland, and Lymphatic System, by Alfred Stengel; and Ophthalmology, by Edward Jackson. If any one point be mentioned as specially noteworthy it is the 35 pages devoted by Clark to the consideration of Carcinoma of the Uterus.

**The Masters of Fate.**—By SOPHIA P. SHALER. New York: Duffield and Company, 1906.

This book, with the subtitle of The Power of the Will, discusses in general the subject of invalidism in its relation to intellectual and moral development. It includes "a brief statement of the achievements of noted persons who, under the stress of grave difficulties, have shown skill in marshalling their physical and spiritual forces to play the part of men." It closes with a short chapter in memoriam of Dr. N. S. Shaler, who was the inspiration of the book and who died while it was in print. His life was a consistent demonstration of the possibilities of the physically weak so well depicted in the chapters of this work. We know of no more inspiring book for those burdened by physical disabilities, and there are few of us who possess not some of these, great or small.

**Buff.—A Tale for the Thoughtful.**—By A PHYSIOPATH. Boston: Little, Brown and Company, 1906.

Buff is a tale that starts out in a promising manner concerning the value of living in harmony with one's environment and trusting much to the restorative powers of nature. It details the history of a "runt" who lived in spite of physicians and finally became a physician himself. By using common

sense methods he achieved wonderful success in practice, many of his cures being veritable fairy tale achievements. The book, though containing many truths, abounds throughout in cheap and crude flings at physicians which can only tend to lower the dignity of the profession in the minds of the laity and create disgust among physicians themselves. As might be expected of an anonymous writer, he (or she or it) introduces many flings against vaccination, this subject being mentioned in at least five places in the text. In one or two instances the subject is germane to the text, in the others it is entirely irrelevant to the matter under discussion. Had the writer not hidden behind the cloak of anonymity (the greatest evidence of wisdom in the book, by the way), we would say more regarding the tirades therein contained. As it is, we have already wasted too much space.

**Stohr's Histology.**—Arranged upon an embryological basis by DR. FREDERIC T. LEWIS from the Twelfth German Edition by DR. PHILIPP STOHR. Sixth American edition, with 450 illustrations. Philadelphia: P. Blakiston's Son & Company, 1906.

The arrangement of this standard textbook upon an embryologic basis, planned by Dr. Schaper, the editor of previous American editions, has been well performed by Dr. Lewis. This plan promises still further to increase the popularity of this histology, already attested by numerous German and American editions. It must be regarded as the logical method of approaching the study of the structure of tissues, and compensates for any of the German text necessarily eliminated.

**An Introduction to Physiology.**—By WILLIAM TOWNSEND PORTER. Philadelphia and London: J. B. Lippincott Company, 1906.

This book of 577 small pages is a collection of experiments in physiology as used by Dr. Porter in his teaching at Harvard. In his course he lays special stress upon experimental work, didactic lectures being subsidiary instead of the primary feature as in the older method of instruction. The book when extended to other fields and enlarged is to become a laboratory textbook of physiology. The experiments are very clearly described and are aided by 74 illustrations. It forms a very instructive guide for the beginner in experimental physiology.

**Diet and Food.**—By ALEXANDER HAIG. Sixth Edition. Philadelphia: P. Blakiston's Son and Company, 1906.

In his preface the author asserts that time only serves to deepen his conviction of the importance of a right understanding of dietary questions, this being the animus of his latest edition.

**A Short Practice of Medicine.**—By ROBERT A. FLEMING. Edinburgh. London: J. and A. Churchill. Philadelphia: P. Blakiston's Son and Company, 1906.

This book contains 730 pages of text, printed in large type. The author intends it as a small-sized

manual, giving the general outlines of individual diseases, leaving special points, clinical illustrations, etc., to be filled in by the student. For this purpose the book is very well arranged and will be found useful to students. For the practising physician it will hardly take the place of more extensive treatises. In general the book is well up-to-date but a number of statements should be changed in future editions, as for instance that suprarenal gland tumors of the kidney are simple growths and as a rule cause no symptoms. For students, the book is one of the best of its kind we have seen.

**The Treatment of Diseases of the Digestive System.**—By ROBERT SAUNDBY, Birmingham. London: Charles Griffin and Company. Philadelphia: J. B. Lippincott Company. 1906.

This little book of 126 pages is based on the author's personal experience and is intended as a foundation for the building up of individual methods upon the general principles enunciated. The first 40 pages, under introduction, are devoted to examination of the patient, the technic of examining stomach contents, etc. Then follow chapters on diseases of the esophagus, stomach, intestines, rectum, and symptomatic diseases depending on any of these. Finally are 24 formulas for preparations referred to in the text. The book contains many valuable hints on the subjects considered.

**Eating to Live—A Book for Everybody.**—By JOHN JANVIER BLACK. Philadelphia and London: J. B. Lippincott Company, 1906.

Dr. Black has written a discursive book which includes discussions of abstract theories of food-stuffs and most minute details about individual articles of diet. Quotations from current works on the subject are freely interspersed with personal ideas as to the fitness of foods. A great deal of valuable material is furnished but in a way that is not so accessible as it should be to accomplish the most good. The book is not divided into chapters and passes from subject to subject in a bewildering manner which leaves the reader in doubt as to what he has read or whither the book is leading him. In spite of this, the book is full of information for the layman and is written from a thoroughly common-sense standpoint.

**Epitome of Pathology.**—By JOHN STENHOUSE, M.D., of the University of Toronto, and JOHN FERGUSON, M.D., Toronto, Canada. 12mo; 285 pages, amply illustrated. Cloth, \$1.00, net. Lea Brothers & Co., Publishers, Philadelphia and New York, 1906. (*Lea's Series of Medical Epitomes.* Edited by VICTOR C. PEDERSEN, M.D.)

This volume treats of both general and special pathology. The former includes a chapter on post-mortem examination and laboratory technic. The derivations of the more difficult words are given, an instructive feature. The material is well arranged and a somewhat careful examination has revealed no serious inaccuracies. One's first thought is to

mention things that have been omitted but on considering the amount of space at the disposal of the writers one rather wonders how they have included so much. The book is a reliable epitome of pathology. We believe the ordinary histologic classification of tumors, although admittedly not so scientific as that of Adami, would have been more instructive for both students and graduates. On the other hand, Adami's classification of poisons is very much better than the one given.

**Catholic Churchmen in Science.**—By JAMES J. WALSH. Philadelphia: The Dolphin Press, 1906.

This is a very readable little book made up of sketches of the lives of Catholic ecclesiastics who were among the great founders in science. The sketches are a collection of magazine articles which have been carefully revised and added to in several particulars. Of the eight chapters the first is devoted to a consideration of the supposed opposition of science and religion and the remaining seven each to a churchman and his work in science, namely, Copernicus, Basil Valentine, Linacre, Father Kircher, Bishop Stensen, Abbé Haüy, and Abbot Mendel. While the historic nature of the work does not admit of a great many of the incisive sayings which are so characteristic of Dr. Walsh, the sketches are very interesting and instructive. A simple recital of facts has seemed to the author the best means of showing that there is no essential opposition between science and religion. In this he is wise, as they are a thousand times more convincing than the dogmatic and biased statements too often advanced on either side. We need more books, both religious and scientific, that are written with this animus.

**The Technic of Operations Upon the Stomach and Intestines.**—By ALFRED H. GOULD, M. D., Boston. W. B. Saunders Company, Philadelphia and London.

The first impression received upon examining this work is the beauty and excellence of the illustrations. They, of themselves, form almost a treatise upon the subject. The author has made an excellent choice of the various operations upon the intestines and stomach. While many operations have been omitted, those selected are typical and are clearly and concisely described. Altogether the author has produced a monograph of value both as regards text and illustrations. A thorough double indexing is a feature of interest which deserves commendation.

**A Treatise on Surgery.**—By GEORGE RYERSON FOWLER, M. D., Brooklyn, New York City. Vols. I and II. W. B. Saunders Company, Philadelphia and London.

The author's method of dealing with general inflammations and inflammations and injuries of separate tissues, is different from that adopted in the usual textbooks. He has arranged the work more in consideration of the practical value to the medical student, which renders it much easier to understand and apply. The chapter dealing with gunshot

wounds is quite modern, much more so than is usually found in textbooks. It is especially good in reference to the injuries received from high velocity projectiles. The illustrations in this chapter are from pictures taken of wounded Japanese of the Russo-Japanese war. The range of this work is quite wide, even to the devoting a few chapters to gynecology and gynecologic operations. While the work should hardly be regarded as a reference work, yet as a textbook for students and general practitioners who wish a surgical guide, it should be ranked among the best produced by American authors. It is well indexed, and both volumes show a high quality of work on the part of the publishers.

**How to Suppress a Malpractice Suit.**—By THOMAS HALL SHASTID. Marion Publishing Company, Marion, Illinois, 1906.

This little book is made up of Miscellanies, eight in number, the article giving it its name being first. Some of them have previously been published in medical journals. All are entertaining and some are very instructive to the medical practitioner. The two concerning compulsory exhibition in personal injury cases are of distinct medicolegal value.

**Saunders' Pocket Medical Formulary.**—With an appendix. By WILLIAM M. POWELL, M. D. Eighth edition, thoroughly revised, enlarged and adapted to the eighth revision (1905) of the United States Pharmacopeia. W. B. Saunders Company, Philadelphia and London.

This book is gotten up with alphabetic indents and interleaving for additional personal formula. The fact that it has gone to the eighth edition shows that many physicians find it useful.

**The Practice of Obstetrics.**—By J. CLIFTON EDGAR. Third edition, revised. With 1,279 illustrations. P. Blakiston's Son & Company, Philadelphia, 1906.

This wellknown book has been reduced in size by about 100 pages, although much new matter and 140 illustrations have been added. Eight new subjects have been added and 14 subjects partly or entirely rewritten. Page numbers have been added to each of the ten part headings. The book is in many ways an improvement over the second edition.

**Chemistry: General, Medical and Pharmaceutical. The Chemistry of the United States Pharmacopeia. A Manual on the Science of Chemistry and its Applications in Medicine and Pharmacy.**—By JOHN ATTFIELD, F. R. S. Edited by LEONARD DOBBIN, PH. D. (Würzburg), F. I. C., F. C. S. Nineteenth edition. Lea Brothers & Co., Philadelphia and New York, 1906.

Attfield's Chemistry has long been a classic. Dobbin's revision is fully up to the exigent standard of the text. The American edition has been adapted to the recent revision of the United States Pharmacopeia. For accuracy, conciseness and due proportion, the book can be cordially recommended both to medical students and to physicians who desire to keep abreast with chemical advance.

## CORRESPONDENCE.

### SOME SUGGESTIONS CONCERNING THE TERMINOLOGY OF OPSONIC THEORY AND PRACTICE.

BY

A. P. OHLMACHER, M.D.,  
of Detroit, Mich.

*To the Editor of American Medicine:*—Sufficient familiarity with the therapeutic possibilities arising from the practical application of the principles enunciated by Sir A. E. Wright, makes it clear that a new era in medicine centers around the work of that investigator. Whatever the medical profession of the United States may already have learned about the theory of opsonins and the practice of curing bacterial diseases by the use of what Wright calls the corresponding "vaccine" may be looked upon as the most limited and modest introduction to their far-reaching, practically universal adoption. It, therefore, seems to me desirable, especially since objections against some of the terms are already well taken, to urge the importance of a uniform, and, as far as possible, rational and specific terminology for the new branch of medical science. This has been brought home to me most forcibly in relation to the word "vaccine" which describes the remedial agent. With its derivation (*vacca*, cow), its adoption to designate particularly the prophylactic agent of smallpox, its employment to describe other bacterial products used by methods differing from those prescribed by Wright; and particularly because of its association in the lay mind with the preventive virus of smallpox, against which, as we all know, a vigorous, even if misguided attack has been directed, I have felt the choice of this word to be unfortunate and as perhaps prejudicial to the fullest success of the therapy founded on Wright's discoveries. In casting about for a substitute, the desirability of additional terms became evident and on consulting our most prominent medical lexicographer, Dr. George M. Gould, concerning it, and other derivatives, I was encouraged to formulate the terminology to be presented in a tentative manner, subject to the criticism of those whose familiarity with Wright's work, or whose lexicographic qualifications incline them to other views.

I would take as a basis the happy choice that Wright and Douglas made of the noun "opsonin" which by its etymology and its association with a beautiful scientific theory must become as inseparably connected with the name of

Wright as vaccine with that of Jenner. Several derivatives have already been coined and adopted, as the adjective "opsonic," and the noun "opsonist" which has appeared in a recent contribution from Great Britain. In an editorial three months ago, I used the words "opsonic therapy" which could be shortened to the compound noun "opsonotherapy;" and as a part of speech to comprehend all work relating to the theory and practice of Wright's discoveries is "opsonology," while the laboratory worker in this new branch of science, as distinct from the opsonist who practises opsonotherapy, could be called an "opsonologist."

To replace the objectionable word "vaccine," and to provide one which would be as distinctive as Wright's theory and practice are from those of other contributors to medical science, I would propose "opsonogen," which I am assured is etymologically correct, and which seems to me to meet the requirements. With the adoption of this noun would come the various descriptive compounds as "staphyloopsonogen," "colonopsonogen," "gonoopsonogen" and so on to replace such terms as "staphylococcus vaccine," "tubercle vaccine," "colon bacillus vaccine" now in use. The indicated verb seems to be "opsonize" and its derivative noun could be "opsonization." One injects an opsonogen to opsonize the individual, or to produce a state of opsonization against the corresponding bacterium. Perhaps we shall later hear of "antiopsonins" and "antiopsonogens." And using two of Wright's descriptive adjectives we may speak of a state of "positive opsonization" or of "negative opsonization."

### TYPHOID FEVER.

BY

W. C. ABBOTT, M. D.,  
of Chicago, Ill.

*To the Editor of American Medicine:*—A significant discussion of the treatment of typhoid fever occurred at the recent meeting of the British Medical Association. At last there are two sides visible instead of the dead level of pessimistic unanimity.

Dr. Thistle, a prominent physician of Toronto, boldly stated his belief that purgatives were the most important part of the treatment, removing the toxic matter from contact with intestinal ulcers, and diminishing the number of bacilli there congregated. After 15 years' use of purgatives he found his mortality had been lower than that of his colleagues. He gave small initial doses of calomel, followed by magnesium sul-

fate, and after this kept the bowels freely open. It will be noted that he said nothing of the prevention of autotoxemia, or of the subsequent use of intestinal antiseptics. But even though he took but the first step, and had not realized the far-reaching consequences of the bacterial processes carried on in the bowel during this fever, he had obtained from this preliminary step better results than others were getting from the old methods.

One of these, Dr. Calwill, considered purgation dangerous, and illustrated his views by a curious but characteristic misconception of symptoms. He found that his constipated patients showed a mortality of only 8 percent, while those suffering with diarrhea died at the rate of 18 percent. Reasoning from effect to cause, it did not seem to occur to him that the cause of the diarrhea was a cause of mortality and the presence of this symptom an indication of irritative conditions in the bowels that did not exist in the constipated patients. Usually we consider irritation as evidence of the existence of an irritant, and an indication for its removal to restore the quiet that indicates physiologic equilibrium. He saw in diarrhea only a bad prognosis.

McCrae followed with another illustration of illogic thinking and jumping at unwarranted conclusions from a single premise. He considered typhoid a general disease, due to the presence of the specific bacilli in the blood and the intestinal malady as a not essential secondary result of the hematic operations of these intruders. Of the mechanism by which the bacilli in the blood localized their action in Peyer's patches he said not a word; nor did he explain why their activity was not manifested in lesions of the delicate walls of the heart and blood-vessels; nor why these effects are not evident during the months and possibly years during which the bacilli are present in the body after cure. To him the presence of infected, putrefying masses in the bowels in contact with open ulcers, with absorption into the blood from the reversed osmosis always present in fevers, evidently means nothing. Even in pneumonia he found purgation harmful, regardless of the admitted gravity of cases characterized by gastrointestinal irritation.

Osler has much for which to answer.

Neilson stated a case in which for intestinal hemorrhage he locked up the bowels for ten days, with recovery—which meant—what? McPhedran also strongly opposed the purgative and antiseptic treatment.

Barker unintentionally confirmed the views

of those who look on the presence of bacilli in the blood as of no practical consequence, by telling how they exist in the body for months after an attack without doing any apparent harm.

Hamilton stoutly held to his belief, despite the pressure, declaring that some patients required purgatives and some antiseptics. It is a pity he did not go on and demonstrate his point that cases should be differentiated, and treatment instituted according to the pathologic conditions they present individually, instead of being huddled together under the name of the disease and treated on the Procrustean plan.

Autotoxemia (and intestinal antiseptics) will not down. Just as it had been formally executed and buried forever, it arises with renewed vigor and a vitality that defies all the power of "authority" to extinguish it. No real clinician can open his eyes to look for evidences of it without seeing them, nor can he give an intelligently directed trial to these agents without being impressed with their efficacy. It is a losing fight that is waged by their opponents, since they have nothing to oppose successfully to the arguments of the advocates of antiseptics, except the injunction to ignore it because some great man says so. Against the opposing admonition to "try for yourself" the appeal to authority is but a sword of lath.

**Contagious Diseases in Philadelphia Hospitals.**—The hospital of the University of Pennsylvania has recently had several cases of diphtheria in its wards, and another hospital has also been quarantined by the Board of Health on account of the occurrence of diphtheria. About a week ago the boards of managers of the Pennsylvania Hospital, the Presbyterian Hospital, and the Jefferson Medical College Hospital decided to refuse admittance to visitors to the patients for a time, as a precautionary measure against the development of contagious diseases. For a year or two the German Hospital has excluded children from visiting patients in the ward as a prophylactic measure against the development of contagious disease.

**Tippling Evil in a Hospital.**—The Kings County, N. Y., Grand Jury for February has adopted a resolution calling on the Grand Jury for March to look into conditions in the Brooklyn Hospital, alleging that the patients in that institution do not receive proper attention from the orderlies unless they bestow gratuities liberally. The superintendent of the hospital has denied that any such condition existed.

## ORIGINAL ARTICLES.

### THE CHOICE OF LIGATURE AND SUTURE MATERIAL IN THE SURGERY OF THE PERITONEUM.<sup>1</sup>

BY

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During the evolutionary period of abdominal surgery, nonabsorbable ligature and suture material was used almost exclusively both inside the peritoneal cavity and for the closure of the abdominal wound, and either twisted or braided silk was most commonly chosen for this purpose.

Those of us who are familiar with the methods of 20 years ago will recall the stitch abscesses presented by almost every patient and the postoperative pains and distress, as well as the slow convalescence and incomplete recovery or confirmed invalidism which followed. So common were these sequels, that patients frequently refused operation, saying they had known many others who had been operated upon, and that they were worse after the operation than they were before it, and far too often, it became necessary to admit, to ourselves at least, that the objection was a valid one and that the criticism was unfortunately true and well-founded.

In the face of all this, we were conscious of having removed gross pathologic lesions, and were quite unable to understand why complete recovery and good health did not always follow our operations, till at last some fellow pointed out that our mass ligature of silk, of huge caliber, though sterile to start with, was often infected in being handled or placed about foul pedicles, and that it then became a foreign body and an irritant, and not infrequently an infecting focus for the formation of a new abscess. The painfully persistent sinuses might, however, after months or years, yield up the offending rope

of silk with its enormous knot, and at last recovery could be expected.

The results of this unhappy experience were after a while shown in the general adoption of either absorbable ligature and suture material, or of very fine silk for intraabdominal work, and the abandoning of mass ligatures for the better method of ligating individual blood-vessels, and, better still, all knots in ligature and suture material were made small and tight, and as few were used as possible. Of late, however, there has been a disposition to forget or ignore some of the valuable lessons of these experiences.

The recent introduction of linen thread infiltrated with celluloid, Pagenstecher thread, or Celluloidzwern, now so commonly used in stomach and intestinal surgery has led some of us into a partial repetition of the errors of the past, and this seems a fitting time and place to consider the value of the Pagenstecher thread and discuss its limitations. It has not the absorbent quality of silk, and this with its smoother surface makes it far more resistant to accidental infection in handling after it has been sterilized, but best of all, it has not the capillarity of silk and so does not carry fluids along its tract and spread infection, but it is undoubtedly far more resistant to absorption and disintegration than is silk, and so remains a foreign body and an irritant for a much longer time. It is strong and light and easily handled and tied or threaded into the eye of the needle, and knots tied in it have little disposition to slip. Compared with catgut, we find each possesses valuable qualities of its own not shared by the other, and we must conclude that each has a field of usefulness of its own. The absorbable quality of catgut makes it, for certain uses in the peritoneum, the material of choice, and this quality alone compels us to use it notwithstanding its known disadvantages, such as the insecurity of knots carelessly tied, etc. The excellent qualities of these materials are complementary, however, one being strong where the other is weak, and the best and most carefully considered surgery of today will aim to use each in its field of greatest usefulness, making

<sup>1</sup> Read at the meeting of the Western Surgical and Gynecological Association, Kansas City, December 28 and 29, 1905.

one supplement the other in fortifying its weak spot.

To illustrate, in the operation of gastro-enterostomy or enteroanastomosis by the suture method, the Pagenstecher thread is splendidly adapted for the through-and-through suture of the mucous and serous coats, because it is permanent, without capillarity and soft and strong and pliable, and when its usefulness is at an end it is cast off into the intestinal canal and eliminated. It has been said that "If silk or linen is used for this suture it may hang *in situ* suppurating for months."<sup>1</sup> And while in rare instances such a suture might be retained for a long time, its advantages so far outweigh its disadvantages as to make its use in such a situation desirable. Catgut is so shortlived and uncertain, even when strongly chromicized, when in contact with the intestinal juices, that it cannot be depended upon, and the practice of using catgut for the mucous stitch and linen for the serous one would seem to me to be a reversal of the best method of application of these materials, particularly as the serous stitch of linen becomes a permanent foreign body with all the disadvantages and dangers that this implies.

On the other hand, a fine chromicized strand of catgut of moderate life, is preferable for the serous stitch, inasmuch as it insures coaptation of the parts for so long a time as is necessary, after which it is absorbed and cannot become an irritant through its retention as a foreign body, for of course, the passage of this second stitch into the intestinal canal must be difficult or quite impossible.

While very fine silk or Pagenstecher thread may be tolerated for serous stitches in the peritoneal cavity, it must be conceded that they carry with them the possibility for harm, and in my opinion such stitches and ligatures would be better, if of absorbable material. I once operated upon a lady rather more than a year after an appendicectomy had been done for her, and I found encysted at the site of the appendix, a pursestring suture of fine silk which showed no signs of absorption nor had it been

cast into the bowel. The removal of dead ligatures of silk from the fallopian tubes has been necessary years after they were placed, and as a rule they have been found little changed. It may be said that these dead ligatures do no harm, but that is not a logical or rational conclusion, beside which we know it is not true, for all of us have seen many patients who suffered severely from this cause.

Soon after the introduction of the Pagenstecher thread, I began to use it for a pursestring suture about the stump of the appendix in my appendicectomies, as did many of my colleagues. I always used the smallest size and tied a firm, compact knot. After this technic was adopted, many of my patients complained of constant pain and tenderness in the appendix region, some of them declaring that they had more pain after the operation than they had before it, a story reminding me of the days of the mass ligature on the stumps of the oviducts. I saw some patients of other surgeons who followed a like technic with like symptoms and I concluded that my nonabsorbable ligature or suture material was at fault and at once adopted another method. It has not been necessary in any of my cases to perform a second operation for the removal of the dead ligature though the pain has in some instances lasted for more than a year and has been very severe.

In the published transactions of the last meeting of this society, appears an allusion to a like experience by Dr. Archibald MacLaren in his paper on appendicitis in women, and I am forced to conclude that his deductions and mine, from the same premises, are correct and that the linen thread was the cause of the pain. At any rate it seems to me to be logical and I shall no longer use nonabsorbable ligature or suture material for purely serous surfaces. The absolute sterilization of catgut is no longer difficult and we now realize that so-called catgut infections usually have their origin in a contamination of the gut through handling, or in allowing it to come in contact with unclean surfaces or substances in or about the wound. Then, too, the chromicizing process prolongs the life

<sup>1</sup>W. J. Mayo, *Annals of Surgery*, November, 1905.

of even the smaller strands to any desired time, providing the mucous surfaces and secretions are not in contact with it. These features make of catgut an ideal suture and ligature material for intraperitoneal use, and all that becomes necessary, is the exercise of due care and skill in the selection of the catgut and the application of sutures and ligatures and the making of knots. So far, I have had the good fortune never to have had a secondary hemorrhage or other accident from the use of catgut, either in the way of a slipping knot or of too rapid absorption, and I believe this immunity from accident to have been due to the exercise of extreme care in its application. In this connection allow me to add that for about three years, I have had great satisfaction in the use of the Downes' electrothermic cautery clamp in selected cases, thus doing away with all ligature and suture materials on pedicles.

For vaginal hysterectomy, particularly in cancer of the uterus, it is ideal. It promotes rapidity and safety in the work and without doubt gives much greater security against the danger of recurrences in early cases. There is, furthermore, in my experience and judgment, no doubt that patients operated upon with the Downes' clamp by either the vaginal or abdominal routes have smoother and more rapid recoveries, and above all a very noticeable freedom from the intense pain and backache so common after all pelvic operations when the terminal nerves of this region are left for days or weeks in the bight of a securely tied ligature or closely applied suture. I have had one or two experiences with the Downes' clamp, however, which lead me to believe that there is increased danger from thrombosis and embolism after its use, occasionally occurring several weeks after operation, and until this doubt is settled I shall be most careful in the selection of the cases in which it is used.

**Proposed Swiss Ban on Absinthe.**—A petition, bearing 168,341 signatures, urging the complete suppression of the manufacture and sale of absinthe in Switzerland, has been presented to the Federal Council. The proposition will be submitted to a vote of the people.

## FIFTY CONSECUTIVE LAPAROTOMIES FOR PYOSALPINX WITHOUT A DEATH.<sup>1</sup>

BY

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By pyosalpinx is meant the distention of one or both fallopian tubes with pus, which is held therein by inversion of the fimbria and adhesions at the abdominal ostium, with a corresponding closure of the isthmus by a hypertrophy of the mucosa and muscular coats. The condition is in reality a purulent cyst of retention. It is caused by an extension of an endometritis the result of gonorrhea or sepsis, by bacterial migration from the intestines through the circulation, by appendicitis, by tuberculosis, or by the residue resulting from the decomposition and suppuration of an ectopic gestation. On presentation of the patient, the history, which is of the utmost importance, will reveal a gonorrheal exposure, puerperal sepsis or tuberculosis, with an existing vaginitis, endometritis, and finally salpingitis. She will have had a sensation of chilliness and malaise, followed immediately by pelvic pain, most severe in one or both sides. An elevation of temperature to 102°-103.5°, rapid pulse, 96-120, constipation, local or general tympanites and menorrhagia are invariably present. The pain is lancinating in character and is referred to one or both thighs; when this is so, it is described as of a boring character. If the patient is in a recumbent position, the knees will be drawn up.

On vaginal examination, if seen in this stage, an indistinct fulness will be discovered in the region of the fallopian tubes. The deeper tissues are thickened and resistant. Extreme tenderness is always present, often making a positive diagnosis impossible. Sometimes a swollen thickened tube can be palpated, the uterus being fixed. On inspection a vaginitis will often be found to exist. In the septic variety of the disease membranous patches

<sup>1</sup> Read before the Fifteenth Censorial District meeting, Altoona, August, 1905.

will be seen scattered over the vaginal wall, resembling diphtheric membrane; these are due to a streptococcal infection. In the gonorrheal form a thick greenish or yellowish pus will be seen to exude from the cervix, while in the septic variety the cervical discharge will be thin, usually tinged with blood, and fetid. On abdominal palpation there will be found a deep tumefaction as well as an extreme tenderness in one or both inguinal regions.

The treatment in this stage should be expectant, consisting of rest in bed, copious vaginal douches of hot water (one or two gallons twice daily), laxatives, local applications of ice, or hot turpentine fomentations over one or both inguinal regions; the hot applications will be found to be the more generally useful. Opium and its derivatives should be withheld if possible, so as not to obscure the progress of the disease. The surgical treatment consists of curetment, but is useful only in the septic variety when some decidua remains, being contraindicated in other forms, on account of endangering the patient by a mixed infection. Chills with rapid pulse, pyrexia, tympanites, and constipation, are indicative of threatening peritonitis and rapid extension of the septic process, and laparotomy with removal of the tubes must be resorted to. Resolution, however, is the rule and a section should not be made unless imperative. The expectant treatment should be followed until the subacute or chronic stage (pyosalpinx) develops.

The symptoms of pyosalpinx are similar to salpingitis; the pain now established, and always present is referred to one or both sides. It is present on moving about, on defecation, urination, and coitus is usually impossible. It is dull, aching in character, becoming worse at the menstrual epoch; beginning several days prior to the flow and continuing throughout the entire period. It will be necessary for the patient to walk with the body flexed, and with great care, and sit down most gently as the slightest jar causes great pain. There is a shortening of the intervals of partial rest, each attack becoming worse (the exacerbations

being due to the escape of pus from the tube causing a local peritonitis), menorrhagia, endometritis, and sterility are accompanying symptoms. By a digital examination during an exacerbation, a mass will be found occupying the right or left or sometimes both sides of the pelvis. Sometimes the tube can be outlined and will be found to be tortuous or sausage-shaped. Occasionally the isthmus of the tube can be outlined close to the cornua of the uterus like a hard cord and when present this is of great diagnostic value. The uterus will be found retroverted and firmly adherent.

Increased temperature and pulse-rate are often found, although no dependence can be placed on these in cases of old pyosalpinx, for I have seen extremely large pus tubes in patients who had had normal pulse and temperature for weeks prior to operation. When the diagnosis of pyosalpinx is made there is only one procedure to follow, namely, celiotomy and enucleation of the diseased parts. Because the thin walls of a pyosalpinx predispose to rupture and leakage of the contents into the abdominal cavity, or to an active inflammation by reinfection from bladder, intestines, or rectum into a sterile pyosalpinx, a rapidly fatal peritonitis may be developed.

Because the contents of a pyosalpinx may be discharged into the intestines, vagina, rectum, or bladder to which by adhesions they have become attached, producing a fatal septic cystitis or a fistulous tract which rarely if ever closes permanently, or the adhesions by which the abdominal viscera are usually so densely adherent, may cause a fatal intestinal obstruction. The lesser dangers are numerous, as the formation of a pelvic abscess, a hemorrhage may occur in a pyosalpinx with a resultant reinfection, the adhesions which have formed produce constant pain by displacing and constricting ovaries, uterus, and bladder. Vaginal examination, trachelorrhaphy, curetment, a sudden jar or fall predispose to rupture, therefore all minor operations on the vagina or uterus are contraindicated.

The pus of a pyosalpinx varies from the most virulent to absolutely sterile pus, in which no liv-

ing microorganisms can be found. But although the acute stages pass and the pyosalpinx becomes more and more sterile until a hydrosalpinx is developed, still the woman has reached an age when from pain and adhesions she remains a nervous wreck or bedridden invalid.

There are cases of pyosalpinx recorded in which the isthmus of the tube supposedly opens, a discharge is poured out and the isthmus again closes. It is extremely doubtful if this ever happens. It is more likely that the endometritis which is always present has produced a discharge sufficient to fill the cavity of the uterus from which it fails to escape on account of the hypertrophied endometrium, until there is such an amount collected that pressure causes a uterine contraction, expelling it.

Pyosalpinx may be either unilateral or bilateral. Should the woman be young and anxious to have children every effort should be made to save at least one tube and ovary. When this is done it should be with the understanding that she is likely to have an infection occur in the remaining tube and a subsequent operation, for, when gonorrhea is the cause of the pyosalpinx the second tube will in all probability become infected, on account of the disease being so deep seated in the utricular glands that repeated thorough curetments are insufficient for its removal.

Some advise that when both tubes are affected, the uterus should be removed at the same time, as it ensures a more speedy relief from suffering, for it is a useless organ without the tubes and ovaries, and retroversion from adhesions as well as endometritis are likely to persist, and there is little or no increase in the mortality. I am not in the habit of doing this, although I believe that at times it would be better.

Without operation it is difficult to estimate the mortality of pyosalpinx. Death may be caused by acute peritonitis, general acute, septic infection, by gradual exhaustion from absorption of prolonged suppuration, or amyloid degeneration of the more important organs.

In the past three years I have operated on 50 cases of pyosalpinx without a death. Of this

number 34 patients were married, 14 single and 2 were widows. Double pyosalpingectomy was done in 30 cases, single pyosalpingectomy in 20. In 44 cases, the pyosalpinx was not ruptured in its removal, in 6 rupture occurred. Drainage was used in only three cases. Appendectomy was done at the time of operation for pyosalpinx in 17 cases. Of these cases 23 were known to have been gonorrheal in origin, 14 were the result of sepsis, 12 were due to unknown causes, and 1 was tubercular. In the 12 unknown cases there were no doubt some due to gonorrhea, which would mean that 50 percent or more were due to gonorrhea. The oldest patient was aged 42, the youngest 14, general average 30. The highest postoperative temperature was 104.6°, average highest postoperative temperature 100.6°. The highest postoperative pulse was 156, the average highest 103. General average time that pulse and temperature became normal after operation 3½ days. In no case did we fail to have the bowels move on or before the third day. General average time in bed 13½ days. Shortest time in the sanitarium was 18 days, longest 34 days. The following complications occurred:

In Case 90 there developed during the second week after operation an abscess of the pelvic cellular tissue; this was opened and drained by way of the vagina.

In Case 212, uremic convulsion occurred 24 hours after operation, followed by two lesser ones. Pulse recorded during convulsion, 156.

In Case 227, there developed a pneumonia on the third day after operation, sending the temperature up to 104.6°.

The following table gives a partial record of each case.

In the cases reported, when celiotomy was decided upon, the preparation of the patient was begun at least 24 hours before operation. Occasionally it will be necessary to have the patient under observation a longer time than this; the nervousness and anxiety produced by delayed operation I believe to be more detrimental than a hasty thorough preparation.

CASE NO.	PYOSALPINGEC- TOMY.	ON REMOVAL.	DRAINAGE.	APPENDICETOMY DONE.	AGE.	CAUSE.	MARRIED, SINGLE.	HIGHEST TEMPER- ATURE.	HIGHEST PULSE.	NORMAL T. AND P.		DAY OF B. M.		OUT OF BED.		TIME IN SAN.	
										DAY.		DAY.		DAY.		DAYS.	
3	Double.	Ruptured.	Yes.	No.	19	Gon.	S.	101	100	3		1		18		21	
7	Single.	Not ruptured.	No.	No.	30	Sep.	M.	101	100	4		2		12		20	
16	Single.	Ruptured.	No.	No.	21	Gon.	M.	100	110	2		3		12		14	
27	Single.	Not ruptured.	No.	No.	20	?	M.	100	104	2		2		12		14	
36	Single.	Not ruptured.	No.	No.	39	?	W.	100	82	2		2		14		21	
40	Double.	Ruptured.	No.	No.	21	Gon.	M.	102	120	5		2		15		20	
42	Double.	Not ruptured.	No.	No.	25	Gon.	S.	102	122	2		2		14		20	
45	Double.	Not ruptured.	No.	No.	35	Sep.	M.	101	110	4		1		11		14	
49	Double.	Not ruptured.	No.	No.	40	?	M.	100	108	2		3		14		21	
52	Single.	Not ruptured.	No.	No.	19	Gon.	S.	100	96	4		2		18		24	
59	Double.	Not ruptured.	No.	No.	41	Sep.	S.	101	80	2		1		15		21	
69	Single.	Not ruptured.	No.	Yes.	40	Gon.	W.	100	84	1		1		12		14	
85	Single.	Not ruptured.	No.	Yes.	20	Sep.	M.	100	114	2		1		13		19	
90	Single.	Not ruptured.	No.	No.	35	Sep.	M.	103	114	4		1		24		33	
91	Double.	Not ruptured.	No.	No.	19	Gon.	S.	100	92	2		2		15		21	
93	Single.	Not ruptured.	No.	No.	28	Sep.	M.	101	88	3		2		15		21	
97	Single.	Ruptured.	Yes.	No.	24	Sep.	M.	100	90	1		2		20		28	
105	Double.	Not ruptured.	No.	No.	20	Gon.	S.	101	108	3		2		16		26	
107	Single.	Not ruptured.	No.	No.	26	Gon.	M.	100	94	2		1		14		19	
112	Double.	Not ruptured.	No.	Yes.	40	?	M.	100	102	1		2		15		34	
115	Double.	Not ruptured.	No.	No.	26	Gon.	M.	100	96	5		2		15		21	
130	Double.	Not ruptured.	No.	No.	26	?	S.	101	90	3		1		13		18	
132	Double.	Not ruptured.	No.	No.	22	Gon.	M.	100	110	1		2		14		19	
150	Double.	Not ruptured.	No.	No.	42	?	M.	100	100	3		1		16		23	
160	Double.	Not ruptured.	No.	No.	37	Gon.	M.	100	90	3		2		14		17	
161	Single.	Not ruptured.	No.	Yes.	32	Gon.	M.	100	98	2		2		12		18	
165	Single.	Not ruptured.	No.	Yes.	20	Gon.	S.	101	98	3		2		15		19	
170	Single.	Not ruptured.	No.	No.	34	Sep.	M.	99	80	2		2		16		27	
173	Single.	Not ruptured.	No.	No.	27	Sep.	M.	99	70	2		3		14		30	
176	Single.	Not ruptured.	No.	Yes.	21	Sep.	M.	102	116	4		2		15		21	
185	Double.	Not ruptured.	No.	Yes.	20	Gon.	M.	100	118	3		3		12		17	
186	Double.	Not ruptured.	No.	Yes.	20	Gon.	S.	100	108	7		3		14		19	
191	Single.	Not ruptured.	No.	Yes.	40	Sep.	M.	100	88	2		1		14		19	
201	Single.	Not ruptured.	No.	No.	34	Sep.	M.	99	88	2		1		14		21	
204	Double.	Not ruptured.	No.	No.	24	Gon.	S.	100	100	2		2		17		24	
206	Single.	Not ruptured.	No.	Yes.	18	?	S.	99	94	3		1		15		20	
208	Single.	Not ruptured.	Yes.	No.	14	Tuberc.	S.	98	104	2		1		4		18	
212	Double.	Not ruptured.	No.	Yes.	20	Gon.	S.	99	156	7		2		15		18	
215	Double.	Not ruptured.	No.	No.	39	Gon.	M.	101	106	5		2		18		22	
216	Single.	Not ruptured.	No.	Yes.	25	Gon.	M.	100	116	7		2		15		19	
220	Double.	Not ruptured.	No.	No.	27	Sep.	M.	101	100	5		2		15		19	
225	Single.	Not ruptured.	No.	Yes.	27	?	S.	100	88	2		1		15		19	
227	Double.	Not ruptured.	No.	Yes.	32	Gon.	M.	104	130	9		2		17		20	
232	Single.	Not ruptured.	No.	No.	28	Sep.	M.	101	120	7		1		14		18	
239	Double.	Not ruptured.	No.	Yes.	32	Gon.	M.	100	96	7		3		18		23	
246	Double.	Not ruptured.	No.	No.	40	?	M.	101	110	5		3		14		20	
253	Double.	Ruptured.	No.	No.	28	?	M.	103	120	3		1		18		22	
259	Double.	Not ruptured.	No.	No.	32	?	M.	101	120	10		2		15		24	
264	Double.	Ruptured.	No.	Yes.	30	Gon.	M.	101	112	5		3		15		21	
262	Double.	Not ruptured.	No.	Yes.	32	?	M.	101	108	4		3		14		21	

On admission to my sanitarium a thorough bath is administered, preferably in the tub, and the patient is at once put to bed. The field of operation is prepared in the following manner: The abdomen is thoroughly shaved and scrubbed with tincture green soap, with a hand brush,

whenever possible, special care being taken about the umbilicus. Next sterile water is used, followed by turpentine, alcohol, ether, and last mercuric chlorid, 1-2000, after which a large mercuric chlorid dressing is laid over the part sterilized, and kept in place by a many tailed

bandage. This preliminary scrubbing lasts from 20 to 30 minutes and is always done by a nurse who has previously sterilized herself by scrubbing her hands and arms in soap and water for ten minutes, and then soaking them in mercuric chlorid 1-1000.

The afternoon before operation magnesium sulfate ( $\frac{1}{2}$  oz.) is administered. No supper is allowed, but before going to sleep a glass of milk is taken, but nothing after midnight, so as to lessen the danger of postoperative vomiting. Six hours before operation an enema of soap and water is given; this is repeated in two hours. A 2 percent lysol vaginal douche is given two hours before operation, and immediately before the patient is etherized the bladder is emptied by catheter. The scrubbing already described is repeated when the patient is on the operating table under ether. While the patient is being etherized, my assistant and myself scrub our hands and arms for 15 minutes, with soap and water, using a stiff brush, cleaning finger-nails thoroughly; they are then immersed in a saturated solution of potassium permanganate, oxalic acid, followed by mercuric chlorid 1-1000. The instruments are boiled for 15 minutes.

The abdomen is opened in the median line by an incision two inches long through which two fingers are introduced. It will often be found in recent cases with only one side involved that this incision will be long enough, but when the adhesions are found to be old and dense and both sides involved, it is better, in my opinion, to enlarge the incision. The patient should be put in the Trendelenburg position so that one will be able to see each adhesion and the effects of tearing them loose, as hemorrhage, stripping the bowel of its peritoneal coat, etc.

Before breaking up adhesions it is my practice to wall off with gauze as much of the peritoneal cavity as possible and to continue to wall off as each new adhesion is taken up and broken or cut. I would advise that great care be exercised in breaking up adhesions; it consumes a little more time, but removing the pyosalpinx intact with no leakage of pus into the abdominal cavity (thus jeopardizing the patient) counterbalances the time consumed. In ligating I use silk, ligating as close as possible to the cornua of the uterus and again as close to the rim of the pelvis as possible. No intermediate ligature is used through the broad ligament until the mass is excised when it will be found that no or few bleeding points will be found, and when present these are easily ligated.

The peritoneum covering the broad ligament which has been divided is now approximated with a fine continuous silk or catgut suture, thus leaving little or no raw surface exposed. Drainage is used only when I have ruptured a tube in an acute or suspicious subacute case. I am satisfied with flushing the abdominal cavity with salt solution if rupture occurs in the removal of long-standing pus tubes.

With great care it will be found that few tubes will be ruptured either in recent or old cases. When drainage is used I prefer gauze, if not gauze then rubber or glass. Interrupted silkwormgut sutures are used for closure of the incision when drainage is used, when no drainage is used I close the abdomen in layers using continuous sutures of fine silk for peritoneum and muscular layers, and close the skin wound with an intracutaneous suture of silk. In dressing I use 18 or 20 layers of gauze over the wound, held in place by adhesive plaster and over this a many tailed bandage. Before leaving the table, the patient is given 0.16 gm. ( $\frac{1}{16}$  gr.) of morphin hypodermically. By using morphin in this way I have found that the suffering immediately following the operation is much lessened, restlessness and vomiting are also decreased, the patient sleeping four or five hours. At the end of eight hours if no vomiting has occurred, 6 mg. ( $\frac{1}{16}$  gr.) of calomel is given every hour for ten hours. At this time also cold water or cracked ice is started in small quantities. If vomiting occurs after the administration of either of these they are stopped for two hours, but usually I find no trouble of this kind. In four hours after the last dose of calomel, 8 gm. (2 dr.) of magnesium sulphate is given. This is followed in six hours by an enema, if necessary.

If there is abdominal distention the rectal tube is introduced, which often is followed with immediate results. Occasionally I have had to resort to high enemas on account of a temporary intestinal stasis.

I have the patient catheterized every eight hours if necessary, but it will more often happen that if you persist in your efforts you will be able to have the patient void her urine. The patient is kept on liquids for one week, followed by semisolid, and on a full tray at the end of ten days, going home at the end of from 18 days to three weeks.

Since writing paper I have had six cases double pyosalpinx and 12 single, with no mortality, making in all 68 consecutive operations for pyosalpinx without a death.

## THE OPERATION OF VENTROSUSPENSION OF THE UTERUS.

BY

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The operation to be selected and practised for the restoration to normal of any ptosed or displaced physiologically mobile abdominal organ, if the principle is to be surgically ideal, must have for its aim the reconstruction of the normal anatomic supports and normal conditions of support. The operation and its result should in no way interfere with the physiologic function of the organ, be free from surgical complication, and since the disease to be treated is not of vital importance, it should be associated with the least mutilation and danger to life.

Could this principle be applied and carried out in the surgical treatment of retrodisplacement of the uterus there would be no ground for diversity of opinion or controversy upon the subject. The uterus, unlike the stomach, liver, and intestines, aside from the action of the intra-abdominal pressure, is not dependent for its support upon a few ligaments, but upon many ligaments, and no ligament or set of ligaments so far as has been determined control the normal position, or when surgically shortened no set of ligaments actually correct the causes of displacement.

The anatomic etiology of retrodisplacement of the uterus is so complex, resident in so many supporting structures, which so far as our knowledge and surgery goes, cannot be completely detected and corrected, and the surgical treatment made ideal. I need not point out that it is not the lengthening of the round ligaments that causes retroversion and retroflexion, although they may be affected in the process, nor changes in the retrosacral or broad ligaments, alone in the uterus itself or the levator ani muscle. The primary cause may be operative in any one of these structures, but the secondary cause is operative in a number, in many cases in all of the supporting structures.

No operation yet devised completely and

effectually corrects every cause, restores to normal the affected anatomic structures, all are subjected to criticism, are more or less mutilating and in no sense ideal. In the process of rotation of the uterus to the position of retroversion or retroversion-flexion none of the supporting structures, except in the case of laceration of the perineum, are truly pathologically injured, but their tonicity of function is lost. It is further a recognized fact that if complicating uterine disease and perineal injury are corrected, complicating intraabdominal disease relieved or removed, and the uterus secured in normal position for any great length of time, this tonicity of ligamentary support is restored, and the uterus in the large majority of the cases remains in normal position until some new cause is operative in bringing about a recurrence of the displacement. Could this be accomplished without surgery, by the use of the pessary in every instance, the pessary would then be the treatment of election. This object cannot, however, be gained by other than surgical means, and it and it alone is accomplished by every operation of recognized worth, devised.

In other words the operation can do little more than is gained by the pessary when this instrument is successful.

It is our belief that the method selected to gain this purpose should be that one which combines the simplest technic, the least mutilation, danger to life and disturbance to the physiologic function, the greatest freedom from recurrence and surgical complication. That it must, of necessity, to be universally adaptable to all forms of retrodisplacement, be performed through an abdominal incision.

These factors of success from my own personal experience, in a study of a large number of cases, has been most satisfactorily gained through the performance of the operation of ventrosuspension, or suspensio uteri.

The principle of this operation, becoming generally known as ventrofixation, was first carried out by Olshausen<sup>7</sup> and Kelly in 1886, although a like procedure had been practised by Tait in 1880 and Koberle in 1885. It consisted in suturing a horn of the uterus to the

anterior abdominal wall, Olshausen, or the tuboovarian pedicle, afterward the ovarian ligament to the abdominal wall, Kelly.

In 1890 Boldt, of New York, and Leopold, of Dresden, practised hanging of the uterus to the anterior abdominal wall by sutures passed directly through the fundus uteri. Kelly, in 1895, first reported 170 cases operated upon by his present method, and designated the operation as *suspensio uteri*, and he severely criticized the method known as *ventrofixation* or *hysterorrhaphy*. Immediately preceding this time, or from about the year 1891, and up to the present time, two positive classes of operation have been performed under the names *ventrofixation*, *hysterorrhaphy*, *hysteropexy* and *ventro-suspension* or *suspensio uteri*. In many instances these names have been employed to describe one and the same operation. Yet it is true that there are practised two distinctly separable operative procedures, the one which should be properly called *ventrofixation* and the other *ventrosuspension*.

The operation of *ventrofixation* permanently fixes the uterus to the anterior abdominal wall, or secures a wide surface of attachment between the uterus and abdominal wall, and completely or almost completely immobilizes the organ. This operation is today widely practised in Europe, and from my personal observation and a consultation of textbooks, it is still being performed to a considerable extent in this country. It is the operation which was generally performed until the development of the Kelly operation of *suspensio uteri* in 1895. Many members of this society, preceding about 1896, I have no doubt, employed this method, grasping a large portion of the uterus, even from horn to horn, with the sutures, and then passing the sutures through at least the fascia of the rectus muscle, often through the entire abdominal wall. Two, three and in one instance I note a German employed as many as 14 sutures for this purpose. The suture material was silkwormgut, often buried in the abdominal wall, and even silver wire was employed.

*Ventrosuspension*, the other operative procedure, is represented in this country by the

technic described by Kelly, in Europe by that described by Leopold. A small area of uterine parenchyma, not more than 1.5 cm. in breadth, and peritoneum of the abdominal wall are included in the two fine silk sutures in the Kelly operation, and in Leopold operation about the same amount of uterine tissue is included, but the silk sutures are passed through the entire abdominal wall, and are temporary sutures. The uterus is thus suspended to the abdominal wall, first directly, and then through the development of a thin fold of connective tissue, one to two inches in length.

These operations, which are known in the literature as one operation, have been subjected to sever criticism—that there follows as a result of the operation complications, often serious and even fatal complications, in pregnancy and labor, and that ileus or intestinal obstruction has resulted. Also, that recurrences take place, and the operation, because it forms an artificial ligament, is not surgically ideal.

Complications to labor have been reported by Milander, that in 20 percent the deliveries were operative, Noble, that in 30 percent of the cases he collected the labor was severe. Dorland collected a great many such cases from the literature, and Lynch found 21 cases in which cesarean section was necessary and 10 cases in which rupture of the uterus occurred as a result of the fixation operation, previously performed. The last and a most complete study of this question has been made by Seegert<sup>1</sup> who, through a very thorough review of the literature, has collected and tabulated 34 cases of complicated labor, describing so far as is possible the character of operation previously performed and the form of complication resulting. Reviewing this table I find that cesarean section was performed 21 times, rupture of the uterus occurred once, postpartum hemorrhage twice, separation of the placenta once, podalic version was necessary in seven, high forceps once, low forceps three times, and abortion occurred, supposedly as a result, in three cases.

In investigating the dates as to when the *ventrofixation* was performed it is found that

<sup>1</sup> Zeitschrift, f. G. U. G. Bd. 55, 1905.

in 27 of the 43 cases it was in or before the year 1895, in 8 cases since that time, and in the remaining 8 the date cannot be estimated. Further reviewing Seegert's table, regarding the character of operation performed, it is found that when the operation is accurately described three or more sutures were employed, and they were mostly silkwormgut, buried. This represents the large majority of cases reported. The remaining operations were simply described as ventrofixation or ventrosuspension. I would call attention to the seeming fact that in most of the complicated cases reported, as is shown by Seegert's table, the report of Milander, Noble, Dorland and Edebohls, the operations which caused the complications were performed before 1896, at the time when a true fixation was the operation generally carried out, and before the frequent practice of the Kelly principle. Nearly all of the complications occurring in America were at this period, but there still continues to be a relative degree of their frequency in Europe, because there the operation of ventrofixation, as the Olshausen operation, is still being extensively performed.

Cases of ileus have been described as resulting from ventrofixation or ventrosuspension, reported by Jacobs, Olshausen, Dardanelli, Sonnenfeld, Rheul, Smith, Hall, and Montgomery. In all, so far as I can learn, nine cases have been described. Six of these accidents occurred in or before 1896, as to the others no date is given. Also, in some the ileus was due to complicating infection, or was not directly caused by the ventrofixation operation.

Therefore, I would call attention to the fact that the complications of pregnancy and labor and the occurrence of ileus took place in the large majority of instances in the developmental stage of the operation, when a fixation of the uterus was always performed. It is further my belief that all of the complications resulting have been due to ventrofixation and not to ventrosuspension. We have no proof, at least to be discovered in the literature, in which a ventrosuspension caused serious complication to labor. On the contrary there are now constantly numerous reports of a statistic study of

the influences of ventrosuspension in this connection, which show that pregnancy and labor are not complicated or with no greater frequency than occurs in women not operated upon. For instance, Guerard reports 57 births, of which 51 were perfectly normal, in five forceps were necessary and in one some hemorrhage resulted after labor from atony. Wiendler, from Leopold's clinic, reports 11 labors of which eight were perfectly normal and three simply premature. Of 154 married women whom we have personally heard from 42 became pregnant and went to term. In 38 the labor was normal, in four instruments were used, in one there was some hemorrhage following labor, in two labor was long and difficult and one died from eclampsia. No complications actually resulted from the operation.

Again, regarding ileus, it must be an exceedingly rare complication, for ventrofixation and ventrosuspension have now been performed many thousand times without such accident, and not more than one instance has occurred in the hands of men of wellknown surgical ability in this country. It must be due to faulty or unclean technic, or as the sutures are secured the operator is careless in determining that no portion of intestine is caught beneath the suture. This should be the positive duty of the first assistant and a definitely routine one.

The most important question concerning every operative method devised for retroversion is that of recurrence. Of all the operations practised there seems to be no question of doubt but that ventrosuspension is followed by the least number of recurrences. Weindler states that from a study of the cases reported 20 percent of recurrences take place after the Alexander operation. Statistics concerning recurrence when the operation was ventrofixation or ventrosuspension are not reported to any extent. Weindler reports that in 124 cases in which Leopold operated there were no recurrences, 51 of these patients were examined several months or years after operation. Each of five European operators in examining a considerable number of cases discovered one in which a recurrence had taken place. Accord-

ing to Andersch, Christiani and Cohn, 6 percent recur. Kustner, in 70 cases examined, had 2.8 percent of recurrences. Kötschaw in 150 cases has had no recurrences. Among our over 500 cases, a great many of which have been examined, there were five recurrences.

The recurrences which have occurred in my experience took place either during the immediate convalescence or soon afterward. In four of the cases it resulted from the constant coughing due to a complicating severe bronchitis or pneumonia. In the other case the operation was performed for a congenital retroversion. Recurrence took place within two months. It was found at a subsequent operation that the ligament had stretched out until it measured four and one-half inches in length. Here the cause of the retroversion remained operative regardless of the suspension and the suspension ligament was insufficient. Others report suppurating incisions as the cause. Still 1 to 6 percent of recurrence is not high, and considering the object of the operation scarcely more than would be expected.

We believe the factor of recurrence would be greatly relieved, as is shown in our statistics, if instead of practising the true Kelly technic, in which the peritoneum of the abdominal wall alone is included in the two silk sutures, in addition several fibers of the rectus muscle on each side of the incision were also included. This makes a stronger ligament, a single connective tissue ligament, possibly containing some muscle tissue, yet it is not of sufficient size or extent to influence the progress of pregnancy and labor. Also, I have recently thought it would be a good plan to immediately introduce a pessary to assist in the support when the convalescence is complicated by bronchitis or pneumonia, when the retroversion is of the congenital type or when there exists a heavy uterus, the pessary remaining in position for two months after operation.

From my personal observation in an experience of over 500 patients operated upon by the method of technic referred to I am convinced that ventrosuspension is one of the most satisfactory operations performed in surgery. In

the 42 cases in which pregnancy occurred there were no complications to pregnancy and labor which were dependent upon the operation and which could or will have occurred independent of the operation. Among the 500 cases there was no such complication as ileus, and as said, we can scarcely appreciate how, with careful technic and the method described, this accident can occur.

The operation accomplished, so far as surgery goes, all that can be gained to restore the uterus to normal position, in that it maintains the uterus forward in position until the ligamentary supports regain their tonicity of function and the uterus its normal equilibrium. It gains little more than the pessary gains in the successful case, represented by the strength of the ligament.

While the operation of ventrosuspension as now correctly performed, because it forms an artificial ligament, is not surgically ideal, with Fritsch, Winter, and Leopold, I believe it is the surest, simplest, and since it is adaptable to all forms of retroversion and retroversion-flexion, it is the best operation yet devised for the cure of this condition.

The criticism that it complicates pregnancy and labor is unjust, that the complications reported resulted from a fixation and not a suspension of the uterus, occurred mostly in the period of the development of the operation or when the operation was incorrectly performed or complicated. The criticism is not applicable to the operation of ventrosuspension as it is now performed. As to ileus I see no reason why it should occur, and question that it does occur with the best technic.

The round ligament operations, the Alexander and now numerous intraabdominal methods, have never appealed to me. They are, as compared with ventrosuspension, unwarrantably complex and mutilating, and the best accomplished no more than does suspension. It is not the function of the round ligaments to form a strong support to the uterus, they are simply guy ropes, and the placing of these thin inadequate muscular bands on the stretch, making them support the uterus, results only

in their again being stretched out, with, if the cause of the retrodisplacement remains active, a recurrence of the displacement. Experience has shown that recurrence is more frequent than in ventrosuspension, and this regardless of the complicated new course the ligament is made to describe. Only within a week we have reoperated in a case in which the Montgomery modification of the Gilliam-Ferguson operation had been performed a year before. The ligaments were found greatly thinned out and the uterus in extreme retroversion.

### AUTOTOXEMIA.

BY

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All the cases classed under the heading of autotoxemia come on in much the same way, and it seems to me they form a large number of the present-day cases which may be mistaken for some other condition, as indigestion, dyspepsia, or constipation. For an indefinite time, longer or shorter, as the case may be, the patient has complained of feeling languid, tired out, with no energy to do anything; this is followed by loss of appetite, coated tongue, bad taste in mouth, foul breath, constipation, headache, and loss of flesh and weight.

The patient may drag along this way for some time before consulting a physician, hoping to get better, but gradually the condition gets worse, fever sets in and he seeks relief for a cold or something else. Other cases may have continued for weeks and in addition to the foregoing, there may be vomiting, bronchitis, inflammation of the kidneys, arteriosclerosis, congestion of the liver, hypochondria, melancholia, and the simulation of other diseases. Any physical defect or malady affects the patient more in any of the foregoing conditions.

A variety of causes may bring on these conditions, among them being eating too rapidly, overeating, irregular meals, eating in between meals, imperfect mastication of food. Lack of exercise may also be a cause, while grief, fear, anxiety, and worry are potent factors in producing the condition. Under one or more

of these factors continued for a time, the stomach gradually loses its tonicity and its acid functions are perverted. Retention and decomposition of food in the stomach follow, with more or less dilation.

The stomach is never empty and never gets a rest, while the bowels in turn become affected and act irregularly. Some of these patients eat and eat too much until the stomach is overloaded with food and the bowels also get clogged and fail to act, while in some cases the food is regurgitated through the mouth. A long train of symptoms may follow upon this condition, both real and imaginary, and if not relieved, the patient may be the victim of many imaginary evils and suffer both mentally and physically from various ailments. The functions of many organs are perverted, as those of stomach, liver, and bowels, while in many cases melancholia and hypochondria may develop and be the last straws that usher in some form of insanity. These cases have many points in common, as nightsweats, loss of weight, anxious countenance, nose bleeding, oppression in the chest, dead weight of limbs and arms, complete loss of energy and physical inertia, also albumin and casts in the urine, a low red blood count and a high white blood-corpuscle count. Black spots can be noticed on the polynuclear corpuscles which may be typical of these cases, and indican is always present in the urine. Many other symptoms of minor importance follow as a result of this condition, as burning sensations about the body or hot flashes and other symptoms.

The organs of the body are affected as the condition is mild or severe, and the diagnosis for this reason may be difficult. Biliousness and congestion of the liver may be a result and the trouble may be attributed to that organ or to the kidneys. The bowels may not act for two or three days at a time. The patient may go to the stool often during the day and have only slight movement or may go three or more times and have a movement each time and then possibly may need to go again. The imagination may inhibit the action of the bowels and so act that the patient may take little or no food

at all, and consequently get into a nervous condition with anemia as a result.

**CASE I.**—Miss J., aged 32. Nationality, Swedish. Occupation, seamstress.

First day, 10 a.m.: For some time the patient had not been feeling well. She complained of a severe pain in her left shoulder, in her back under the left scapula and across the forehead. She looked pale and thin. Cheeks were flushed and the countenance expressive of anxiety and suffering. Around the margins of each eyelid was a wellmarked zone of redness while the eyes were sore and watered.

She had no energy, felt languid, tired out, and never seemed to get rested. She did not sleep much at night and was getting more nervous and irritable. Tongue was heavily coated, dryness of lips and mouth and sordes on latter were present. She had no appetite. Belched up gas, vomited some, and lost weight. Breath was foul and she had a bad taste in the mouth. Skin was dry, bowels constipated and urine scanty.

Over the area of the stomach, a good deal of soreness was present, while gurgling and splashing sounds could be heard. Stomach was weak and bothered the patient considerably. There was some pain and tenderness over the abdomen which was not localized.

Tympanites was present; some oppression and heaviness in the chest; a tight and frequent cough with difficulty in expectoration. Abundant rales, of the moist and coarse variety, could be heard all over the lung areas, both behind and in front. The chest wall was thin, the supraclavicular and infraclavicular fossas depressed, while in the left infraclavicular fossa, a low weeping sound could be heard distinctly. On the right side of the nipple, a creaking sound was noted. Heart-beats were feeble with apical and basic murmurs. The beat was communicated to the stomach area while the pulsation of the abdominal aorta could be heard and felt through the abdomen. The pulse was 120; temperature, 98.5°; respirations, 36. The blood: Red blood-corpuscles: Lowest count during illness 1,200,000, third day; improvement after treatment 3,856,000 eighth day. White blood-corpuscles: Lowest count during illness 2,200; highest count 38,000; polynuclears 89.2 and 86.8; specific gravity 1.060; Hg. 100. Urine: 512 cc. in 24 hours increasing up to 1,500 cc. after treatment. Albumin, a faint trace. Casts, hyaline and granular. Sputum examination, no tubercle bacilli.

First day, 10 p.m.: Pulse weaker, breathing

lighter while a wheezing in the throat was noted. Her hands and feet were cold. Trouble in moving fingers and picking bedclothes.

Second day, 9 a.m.: Pulse, 110; temperature, 99°; respirations, 30; 9 p.m., pulse, 140, quick, feeble and almost imperceptible. Temperature 98.5°, respiration 40, quicker and lighter. Passing down from the chest to the abdomen was a wellmarked wave-like motion resembling Cheyne-Stokes' type of breathing. The hands and feet were cold and numb. The arms were heavy and like a dead weight and the patient was unable to lift them. She continued picking the bedclothes. Her eyelids were half closed and the pupils dilated. Eyeballs turned up under eyelids. She had all the appearance of passing away. She closes her eyes and dozes off to sleep from time to time, while it is hard to rouse her. She was never unconscious at any time but could always be roused and was able to answer any questions asked her.

Third day: Pulse, 110; temperature, 100°; respirations, 30.

Fourth day: Pulse, 110; temperature, 99°; respirations, 26.

Fifth day: Pulse, 80; temperature, 98.5°; respirations, 24.

Sixth day: Pulse, 82; temperature, 98°; respirations, 24.

Seventh day: Pulse, 82; temperature, 98°; respirations, 22.

Eighth day: Pulse, 72; temperature, 98.5°; respirations, 24.

From this time on the patient continued to improve and a few days later was able to sit up in a chair, feeling better and stronger.

Diagnosis: This was not easy, but rather confusing an account of the peculiar symptoms. First one thing and then another seemed to trouble the patient, while there was a simulation of numerous diseases, as tuberculosis of the lungs, typhoid fever, ulcer of the stomach, dilation of stomach, pleurisy and pneumonia, while heart murmurs and kidney trouble complicated the condition.

In this case the diagnosis was anemia from malnutrition and intoxication from delayed and decomposed food in the stomach and intestines in a neurotic subject.

Treatment: 1. Bowels well moved in the beginning. 2. Nothing but milk for nourishment as required, at times, milk and brandy with plenty of water as patient wished. 3. For thirst small pieces of ice to be sucked with lemon juice for dryness of lips and mouth. 4. Vomiting, hot water bag over the stomach, quietness, and small amounts of liquid. Crit-

ical Stage: 5. Strychnin sulfate 2 mg. ( $\frac{1}{80}$  gr.) pill every three hours. 6. Digitalin 0.6 mg. ( $\frac{1}{100}$  gr.) hypodermically and internally often. 7. Ammonium chlorid 0.2 gm. (3 gr.) tablets at times. 8. Aromatic ammonia inhaled. 9. Nitroglycerin compound, tablet every two hours. 10. Spirits of camphor rubbed over the forehead. 11. Mustard plaster over heart. 12. Hot plates all over the body. 13. Flicking chest and face with wet towel. 14. Plenty of fresh air and light covering as the weather was very hot. 15. Later tonics and suitable diet. 16. Patient made a good recovery.

CASE II.—Mrs. C., aged 38. Occupation, housewife.

First day: Patient had not been feeling well for four or five weeks and did not know just what the trouble was. Languid, tired out, and had lost her energy. The whole body seemed exhausted. She was losing weight and getting worse all the time. Loss of sleep, night sweats, and a continual pain across the forehead bothered her all the time.

She complained of a pain across the upper part of the chest extending from one side to the other, but more localized and severe on the left side in the infraclavicular fossa which continued for some time. Later she had severe pains shooting up the nape of the neck, and pains across the small of the back which felt heavy and sore. Urine was scanty and the bowels had not moved for two or three days. She had a bad taste in her mouth continually. Tongue was heavily coated white. Mouth and lips were dry. Breath was foul and there was loss of appetite.

General tenderness was present all over the abdomen and especially over the area of the stomach which felt sore on much pressure. There was soreness over the liver and in the epigastric region, it felt as if a lump was fastened there and would not move, being sore to the touch. Gurgling and splashing sounds could be heard in the stomach with dulness toward the pyloric end. The organ was distended and dilated about three inches. Gurgling sounds were heard from the second rib, left side down, and especially over the heart area. On the right side rumbling noises were heard over the lower part of the lung from the nipple down.

The patient vomited some and belched up wind from time to time. Hemorrhage occurred twice from the nose, the last time the amount of blood was considerable. At intervals hemorrhage from the uterus occurred and a yellowish discharge for some time. Previous to this she had had dysmenorrhea. Around the apex of the

heart, a continual blowing sound was heard like the puffing of a locomotive, while at intervals the heart fluttered a good deal and seemed to the patient as if it would jump out, the sensation was so peculiar.

Eyes were sore and watered. She had a cough and brought up large pieces of mucus. Pulse 90, temperature 100.5°, respirations 24. Blood: Red blood-corpuscles: Lowest count during illness 2,000,000; after recovery 4,296,000. White blood-corpuscles: Highest count in illness 25,000; polynuclears 90.4 and 86.0; specific gravity, 1.060; Hg. 100. Urine: Specific gravity from 1.010 to 1.034; no albumin but hyaline and granular casts; black spots noted on polynuclear cells.

Second day: Temperature, 100.5°; pulse, 100; respirations, 24. Heart fluttering a good deal and the same puffing sound heard over the apex. Swimming of head bothers the patient.

Third day: Temperature, 102°; pulse, 120; respirations, 24.

Fourth day: Temperature, 101°; pulse, 100; respirations, 24. Coldness of hands and feet: Bleeding of nose. Pain in the chest. It hurts to take a deep breath.

Fifth day: Temperature, 103°; pulse, 120; respirations, 30. Nose bleeding. Chest feels heavy. Soreness of chest and abdomen. Breathing more difficult. Back hurts some and pains to move or turn in bed.

Sixth day: Temperature, 102°; pulse, 120; respirations, 50. Mouth dry, breath foul, and patient says the left lung is rotting away. Countenance is expressive of anxiety and patient thinks she will die. Swimming of the head and fluttering of the heart continue. Chest feels like a dead weight and can hardly be moved and there is a good deal of oppression in it. Arms are heavy, useless, and can hardly be lifted. Coldness of hands and feet. Breathing quick and difficult. Gurgling and rumbling sounds heard in the stomach and chest are audible to patient. Picking bedclothes and dozing to sleep.

Seventh day: Temperature, 100.5°; pulse, 110; respirations, 30.

Eighth day, a.m.: Temperature, 99°; pulse, 100; respirations, 20; p.m., temperature, 99°; pulse, 88; respirations, 24.

Ninth day, a.m.: Temperature, 98.5°; pulse, 88; respirations, 24; p.m., temperature, 98.5°; pulse, 88; respirations, 28.

Tenth day: Temperature, 98.5°; pulse, 84; respirations, 24.

Eleventh day: Temperature, 98°; pulse, 80; respirations, 24.

Twelfth day: Temperature, 98°; pulse, 84; respirations, 24.

Thirteenth day: Temperature, 98°; pulse, 84; respirations, 24.

Treatment. From this time the patient continued to improve, get stronger and in a week was able to be up. Washed out stomach with an antiseptic solution and warm water which benefited the patient. A few days later she went out for a walk and found she was considerably reduced in weight. Previous to this she was treated for stomach trouble and varicose veins in leg. Her weight was then 215 pounds and she got around all right.

Diagnosis: This case resembled the former and it was not easy on account of the variety of symptoms and simulation of numerous diseases, as cerebral trouble, tuberculosis of lungs, pneumonia, typhoid fever, pleurisy, empyema, abscess of the lung, and chronic gastritis.

The diagnosis was dilation of the stomach, malnutrition, and intoxication from delayed and decomposed food in the stomach and intestines.

Treatment: 1. Bowels kept open regularly. 2. Nothing but milk for nourishment, sometimes milk and brandy as required. 3. Plenty of water as necessary. 4. Tincture of aconite 3 mg. ( $\frac{1}{20}$  gr.) in pill every hour. 5. Quinin sulfate 0.2 gm. (3 gr.) every three hours. 6. Chlorotone for sleeplessness. 7. To relieve pain and vomiting hot water bag was put over stomach and very little liquid given at a time. 8. Strychnin sulfate 2 mg. ( $\frac{1}{30}$  gr.) every three hours. 9. Digitalin 0.6 mg. ( $\frac{1}{160}$  gr.) internally. 10. Tablet ammonia chlorid 0.2 gm. (3 gr.) each. 11. A clay plaster spread thickly over the chest for a time somewhat relieved the patient. 12. Salol 0.16 gm. ( $2\frac{1}{2}$  gr.) three times a day. 13. Nitroglycerin compound taken every two hours. 14. Tonics and fresh air. The patient made a good recovery.

CASE III.—Mrs. K., aged 60. Nationality, Scotch. This case came on much the same as the two preceding. First day: Patient had not been feeling well for some time and was getting worse. Felt languid, tired out, and as if she was no good for anything. She had been eating rather largely of meat and getting no exercise or fresh air. She had no appetite and no desire for food. Bowels were confined and had not moved for two or three days. Tongue was heavily coated white, the mouth and lips were dry, and breath foul. She had a bad taste in the mouth and was belching up gas continually. She had a hard irritating cough with difficulty in bringing up mucus.

Sometimes after straining yellowish pieces were brought up slightly tinged with blood. Skin was dry, urine scanty, and sweating occurred at night. Eyes were sore and watered. No pain was complained of anywhere except in the chest when cough was troublesome. There was tympanites over the abdomen and a general tenderness which was not localized; fulness was present in the region of stomach, with dulness, gurgling, and splashing sounds; loss of sleep, irritability, and restlessness were complained of and vomiting at different times, and arteriosclerosis.

When I first saw the patient she was sitting up in a dazed condition and moaning a good deal, which continued for a few days. Temperature, 104°; pulse, 120, full and hard; respirations, 36; 10 p. m., temperature, 103°; pulse, 108; respirations, 28. Moaning and picking bed-clothes.

Blood: Red blood-corpuscles. Lowest count during illness, 600; highest count, 30,000; polynuclears 98 and 95.0; black spots on polynuclears.

Urine: Specific gravity from 1.010 to 1.020; chlorids, 9 percent to 30 percent; indican, 5 to 20 percent; casts, hyaline and granular; albumin, a trace to 2 percent; urine in 24 hours 125 cc. to 500 cc.

Sputum: No tubercle bacilli but pus cells, pavement cells, pneumococci, micrococci, staphylococci, *Streptococcus conglomeratus* and *sarcinae*.

Second day, 10 a. m.: Temperature, 102.5°; pulse, 100; respirations, 32. Sleep was disturbed. The patient coughing and moaning continually; 5 p. m., temperature, 103°; pulse, 104; respirations, 32; 8 p. m., temperature, 103°; pulse, 102; respirations, 28. Moaning. Prune juice sputum and gurgling in stomach.

Third day, 11 a. m.: Temperature, 100.4°; pulse, 84; respirations, 20; 8 p. m., temperature, 100.4°; pulse, 94; respirations, 20.

Fourth day, 10 a. m.: Temperature, 98°; pulse, 91; respirations, 32; 7 p. m., temperature, 101°; pulse, 83; respirations, 20.

Fifth day, a. m.: Temperature, 98°; pulse, 72; respirations, 20; 1 p. m., temperature, 98°; pulse, 70; respirations, 36; 5 p. m., temperature, 99°; pulse, 75; respirations, 28; 10 p. m., temperature, 98°; pulse, 70; respirations, 20.

Sixth day, 7 a. m.: Temperature, 98°; pulse, 65; respirations, 24; 2 p. m., temperature, 98°; pulse, 64; respirations, 25; 5 p. m., temperature, 98°; pulse, 68; respirations, 26.

Seventh day; Temperature, 98°; pulse, 60; respirations, 24.

Eighth day, 11 a. m.: Temperature, 98°;

pulse, 68; respirations, 22; p.m., temperature, 98°; pulse, 63; respirations, 24.

Ninth day, a.m.: Temperature, 98°; pulse, 70; respirations, 25; p.m., temperature, 98°; pulse, 70; respirations, 24.

Tenth day, 9 a.m.: Temperature, 98°; pulse, 63; respirations, 24; 3 p.m., temperature, 98°; pulse, 61; respirations, 24; 9 p.m., temperature, 99°; pulse 64; respirations, 25.

Eleventh day, a.m.: Temperature, 98°; pulse, 66; respirations, 21; p.m., temperature, 98°; pulse, 67; respirations, 24.

Twelfth day, a.m.: Temperature, 98°; pulse, 70; respirations, 24; p.m., temperature, 98°; pulse, 70; respirations, 24.

Thirteenth day: Temperature, 99°; pulse, 74; respirations, 20.

Fourteenth day, a.m.: Temperature, 98°; pulse, 76; respirations, 21; p.m., temperature, 98°; pulse, 65; respirations, 20.

Fifteenth day: Temperature, 98°; pulse, 67; respirations, 20.

Sixteenth day: Temperature, 98°; pulse, 78; respirations, 24.

Diagnosis: The onset of this case with delirium and subsultus tendinum seemed peculiar at first and it was difficult to get at the foci of the trouble while the arteriosclerosis, bronchitis, stomach and bowel symptoms, and casts in the urine all pointed in different directions; however, the history of the case, the urinary findings, blood and sputum examination helped to clear it up and the other symptoms pointed to gastrointestinal trouble.

A diagnosis was made of malassimilation of food and arteriosclerosis dependent upon intoxication from delayed and decomposed food in the stomach.

Treatment: Dietetic, hygienic and medicinal.

1. Pill aconite 3 mg. ( $\frac{1}{20}$  gr.) every half hour.
2. Nothing to eat for two or three days.
3. Milk for nourishment as required.
4. Bowels kept open regularly.
5. Mouth wash of antiseptic solution.
6. Salol 0.16 gm. ( $2\frac{1}{2}$  gr.) three times a day.
7. Diuretic tablets.
8. Strychnin sulfate 2 mg. ( $\frac{1}{80}$  gr.) as required.
9. Digitalin 0.6 mg. ( $\frac{1}{100}$  gr.).
10. Tablets for cough.
11. Colon flushing.
12. Massage.
13. Bathing and rubbing.
14. Tonics and fresh air.
15. Good recovery.

CASE IV.—Mrs. S., aged 38. This patient looked strong and healthy. She first complained of a pain in her stomach and bowels, having kept a hot water bag over them for relief. Pain across forehead constantly, and continual headaches. For some time she had not been feeling well, was upset and not like herself,

while at times she felt like knocking people down. Loss of energy, tired out, and nervously exhausted. Meals irregular, loss of appetite, and weight decreasing. Eyes sore, with watering and smarting. Color of face good and has flushings at times. Sweats considerable during the day and sometimes at night. Nose bleeds occasionally.

Gurgling and splashing sounds heard in stomach, with pain, soreness, dulness and a full feeling. Bilious occasionally. Tympanites, tenderness, and soreness present over the abdomen. Bowels are constipated and the patient says she would like to tear them out. Tightness around the region of the stomach with a hot feeling, sensation of pins and needles sticking her around the chest. Is sensitive and has crying fits at times which she cannot help. Periods had been irregular, while at a previous time she had bronchitis, pneumonia, and typhoid fever. Has taken a good deal of strong coffee, while strawberries, pickles and fish do not agree with her and cause hives. Feet and hands get cold and she does not sleep well at night. Pulse, 80; temperature, 99°; respirations, normal. No rise of temperature in this case.

Blood: Red blood-corpuscles: Lowest count 3,432,000. White blood-corpuscles, 5,600. Specific gravity 1.070; Hg. 115; eosinophiles, 6 percent; polynuclears, 62.8 and 70; indican excess 5 percent. No albumin and no casts in urine.

Treatment: 1. No food for two or three days. 2. Bowels regularly moved and freely. 3. Milk as required for a time. 4. Salol 0.16 gm. ( $2\frac{1}{2}$  gr.) three times a day. 5. Nitroglycerin compound, taken every two hours. 6. Chloretone for sleeplessness. 7. Rest and quietness. 8. Tonics and fresh air. 9. Good recovery.

CASE V.—Mr. J. R., aged 18. Nationality, German. Patient had not been feeling well for some time and was not getting any better. Tired out all the time. No energy for anything. Loss of appetite. Tongue coated white. Headache all the time. Bad taste in mouth and bloating. Bowels are constipated and he had taken calomel, jalap, and elaterium to move them but without any effect. Face is sallow. Pulse feeble. Temperature normal. Has eaten all kinds of things in between meals as candy, soft drinks, peanuts, etc. Dulness and pain all over the region of stomach with distention and dulness all over abdomen.

Treatment: 1. Tried to pass stomachtube but patient could not pass it. 2. Gave emetic of wine of ipecacuanha, half ounce, but it failed to act. 3. Gave hot water but no act-

ion. 4. Gave hypodermic injection of apomorphin hydrochlor. 6 mg. ( $\frac{1}{10}$  gr.) which soon acted and caused vomiting of a great deal of mixed material at once and a large quantity. It also caused the bowels to act very freely.

Made patient faint and sick, but rest, strychnin sulfate 2 mg. ( $\frac{1}{80}$  gr.) made him all right and the next day he was feeling much better.

CASE VI.—Miss K., aged 28. Nationality, Polish. This case began the same as the others. Patient had not been feeling well for some time but was tired out and losing all energy. She was a strong, healthy girl with a ruddy complexion. Mostly complained of pain in the region of stomach which was sore and tender to touch. Gurgling and splashing sounds could be heard. Pain extended up the sternum. Tongue coated white. Breath foul and bad taste in mouth. Bowels irregular. Eyes sore and water. Constant headaches. Feels warm all over chest and abdomen; then has chilly sensations. Night sweats and vomiting. Fits of crying she could not help. Pulse, 88; temperature, 98°.

Treatment: 1. No food for two or three days then only milk. 2. Bowels moved freely and regularly. 3. Tablets for pain. 4. Salol tablets 0.16 gm. ( $2\frac{1}{2}$  gr.) three times a day. 5. Chlorotone for sleeplessness. 6. Regulation of diet. 7. Fresh air and tonics.

CASE VII.—Mrs. J. G., aged 50. Nationality, Swedish. Occupation housewife. The patient complains of chills and headache at different times. Feels she has no energy and gets tired out easily, while for some time she has not been feeling well. Takes cold easily. Loss of appetite. Gurgling and pain in stomach. Tongue coated white and bad taste in mouth. Bloats a good deal. Ringing in ears. Losing weight all the time and is getting more nervous.

Treatment: 1. Rest in bed. 2. Milk for nourishment. 3. Bowels regularly moved. 4. Tablets for pain. 5. Salol 0.16 gm. ( $2\frac{1}{2}$  gr.) three times a day. 6. Fresh air. 7. Tonics. 8. Antiseptic tablets for stomach.

**Tea as a Beverage for Soldiers.**—As the result of observations made while with the Russian army in Manchuria by Colonel Valery Havard, Assistant Surgeon-General in the United States army, tea is much more suitable as the routine military beverage than coffee. It is considered easier to transport, preserve and prepare, and has been adopted by the English, Russian and Japanese armies. Colonel Havard recommends that it be substituted for coffee in the United States army rations.

## GASTROPTOSIS WITH SPECIAL REFERENCE TO ITS TREATMENT.\*

BY  
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of Philadelphia.

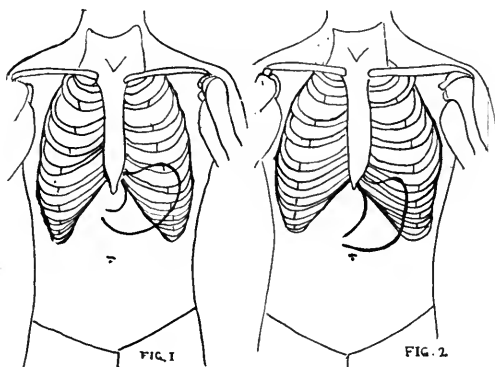
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The purpose of this paper is to direct attention to a disease that is a frequent cause of chronic invalidism, particularly in women, and to the fact that anomalies in the position of the stomach are more frequently overlooked than recognized.

Gastroptosis is a falling of the stomach, existing alone or more commonly in association with dislocation of one or more of the other abdominal organs. The right kidney, transverse colon, and liver are the organs most frequently dislocated in conjunction with the stomach, less frequently the left kidney, and only very rarely the spleen.

Fig. 1 shows the normal position of the stomach.



The stomach may be dislocated partially or in its totality. Partial displacement in which there is a sinking of the pyloric end of the stomach is the more common, while total falling of the stomach is less frequent owing to the attachment of the cardia to the vertebrae. The type of dislocation of the stomach will be deter-

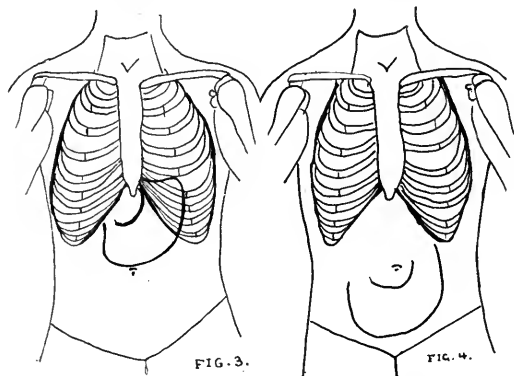
\*Read at the meeting of the Medical Society of the State of Pennsylvania, held at Bedford Springs, September 11-13, 1906.

mined by the position of the pylorus and of the lesser curvature. Therefore, to make a diagnosis of gastropptosis, it is not sufficient to determine only the lower boundary of the stomach, but the lesser curvature must also be found in a lower position than normal.

The stomach may assume the vertical, Fig. 2; subvertical, Fig. 3; or the crescent form, Fig. 4. The subvertical position of the stomach is the most common, while the crescent or looped shape is least frequent. As a rule, however, gastropptosis is complicated by a more or less advanced degree of dilation of the stomach.

Fig. 6 shows a dilated dislocated stomach with downward and lateral dislocation of the liver. Fig. 10 represents a dilated and dislocated stomach with dislocation of both kidneys.

The symptoms are usually those of atony of the stomach and intestines, with accompanying motor insufficiency. There is frequently present gastric retention and fermentation and nearly all patients are constipated. The appetite is impaired and the patients are weak and often in a state of malnutrition. Malposition of the stomach and certain neurasthenic and hysteric symptoms are frequently found together. There are cases of gastropptosis, however, in which there are no symptoms. A



floating tenth rib and other congenital stigmata are relatively common in cases of gastropptosis. In fact, many cases have a typical visceroprotic physique. The abdominal walls are usually relaxed, particularly in multiparous women. Diastasis of the recti abdominal muscles is also common.

The diagnosis of gastropptosis is usually not

difficult and can be made in most instances by the ordinary clinical methods at our disposal, *i. e.*, inspection, palpation, percussion, and inflation. Auscultory percussion and tuning for percussion are valuable aids in outlining the stomach. There are undoubtedly a number of cases in which simple inspection will reveal the fact that the stomach is situated low down in the abdomen, Fig. 5. Many of these patients

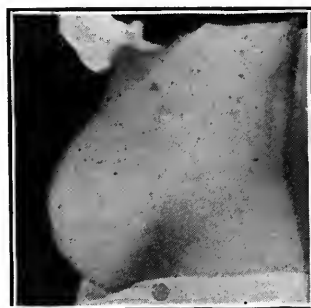


FIG. 5.—Gastropptosis in a woman of 47. Lateral view showing a prominence of lower part of the abdomen.

have a long slender body with a bulging of the lower part of the abdomen and a sinking in of the epigastrium. However, it is always better not to content oneself with inspection alone, but always to control the diagnosis by inflation of the stomach.

The gastrodiaaphane is recommended by some clinicians for outlining the stomach. In doubtful cases the röntgen-ray and the bismuth method probably form the best means of determining the boundaries and the position of the stomach. Figures 7, 8, and 9 represent the size and position of the stomach as shown by drawings made from röntgen-ray pictures, through the courtesy of Dr. Charles B. Worden. Figures 7 and 8 show the vertical stomach with its irregular outline. Fig. 9 illustrates a low position of the stomach, and dislocation of the transverse colon with adhesions between it and the descending colon.

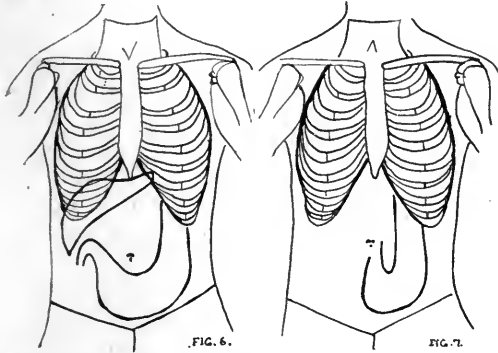
The treatment of gastropptosis should be preventative so far as possible. Therefore, clothing that forces the abdominal organs downward should be modified and more attention should be paid to bandaging the abdomen in women during the lying-in period so that the

abdominal muscles may regain their normal tone and the abdomen its normal shape. This part of the treatment appears to be neglected and the tendency on the part of many practitioners is to discard the use of the abdominal binder following childbirth. This is a mistake as attested by the condition of the abdomen in women who have borne several children. The

new one should be applied, and the customary bath may even be taken while wearing the plaster. A cloth bandage or form of corset may be employed and should have some attachments to prevent the corset from slipping out of place.

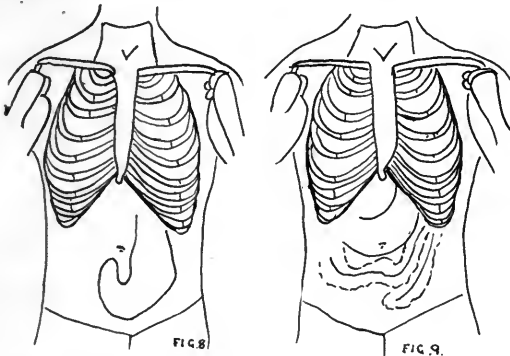
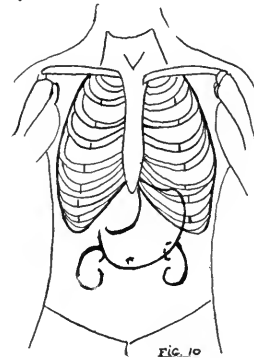
Wherever much pressure is brought to bear, a suitable pad should be inserted. In some cases this treatment together with a regulation of the diet is all that is necessary. Of course, the patient will have to wear the support permanently, except in rare instances.

The diet should be nutritious and easily digestible, therefore, small meals of a soft diet at frequent intervals will probably best accomplish this purpose, as this form of diet does not tax the motility of the stomach and passes readily into the intestine, while a dry diet is not dis-



treatment proper of dislocation of the stomach is largely mechanical. Rest cures that force the patient to lie still sometimes act favorably.

The relief experienced by many patients after the application of an abdominal support is most gratifying. Various forms of bandages for supporting the abdominal organs have been recommended. No one form of binder or band-



age fits all patients; therefore, the bandages will have to be adapted in each individual case. Adhesive plaster, as advised by Dr. Rose, of New York, and others, when properly applied, serves very well as a temporary bandage. The plaster is cheap and causes but little inconvenience. The patient may wear it for a week or two, or until it becomes loosened, when a

charged as easily from the stomach. Any stated diet list cannot well be given as the food should be suited to the condition of the gastric secretion and motility. The patient should lie down after eating. Liquids are best administered in small quantities, a glass or two of water should be taken when the stomach is empty. Many of these patients suffer from a dryness of the tissues; therefore, a sufficient amount of water should be administered.

Lavage is indicated when there is retention. When atony and ectasis are present, hydrotherapy, massage, gymnastics, electricity, and the administration of strychnin are of value. The stools should also be carefully regulated. However, there are cases, particularly overworked neurasthenics, who do not improve under the

treatment while they remain at home and continue their occupation. In these cases a change of environment with mental and physical rest is sometimes followed by marked improvement.

I saw recently a married woman, aged 28, mother of five children, who had gastroptosis with severe neurasthenia. She did her own housework, and in her case no improvement took place under medical treatment including bandages, etc. This woman was sent to Atlantic City and upon her return a few weeks later I saw her again. She had gained in weight and there was a complete disappearance of all the symptoms.

The medical treatment as outlined should be persistently applied, and, therefore, given a long trial before surgical measures are advocated. Consideration must also be given to the fact that the patients often are of a profound neurotic type. However, there are cases in which this treatment does not give relief. Vomiting persists, dyspeptic symptoms continue to be severe, there is a gradual emaciation, and in these cases operation is to be recommended. There are also cases of gastroptosis in which the position of the stomach produces a kink or twist at the pylorus as pointed out by Kussmaul, which may require surgical intervention, as will those cases in which peritonitic adhesions, tumors, etc., exist.

Duret,<sup>1</sup> of Lille, performed the first operation of "gastropexy" by stitching the lesser curvature of the stomach to the abdominal wall. The patient, a married woman, did well and in two years had gained 25 pounds in weight.

Davis<sup>2</sup> performed a similar operation, but instead of suturing the stomach to the abdominal wall, he passed the stitches through the gastrohepatic omentum.

Rovsing<sup>3</sup> operated in three cases of gastroptosis by passing the sutures transversely through the anterior wall of the stomach, and at each end through the abdominal wall. The anterior surface of the stomach was scarified with a needle, and in tying the stitches adhesions to the abdominal wall were secured.

Hartmann<sup>4</sup> fixed the pyloric end of the stomach to the parietal peritoneum, after plicating the dilated pyloric end.

Coffey<sup>5</sup> elevated the stomach in two cases by suturing the greater omentum at a point one inch below the attachment of the transverse colon to the anterior abdominal wall one inch above the umbilicus.

Clarence Webster, of Chicago, in 1901 advised in cases associated with diastasis of the recti muscles, that this condition be remedied by resection of the fascia and approximation of the muscles.

The most satisfactory method for elevating the stomach is probably the one described and performed by Beyea.<sup>6</sup> In this operation the stomach is elevated by shortening the normal ligamentary supports, *i.e.*, the gastrohepatic and gastrophrenic ligaments. By this method the motility of the stomach is not interfered with. A similar operation has been performed by Bier.

In an operation which has for its object the production of adhesions between the stomach and abdominal parietes, the motility of the organ is disturbed, and the last state of the patient is probably as bad as the first.

Gastroenterostomy has been performed a number of times for gastroptosis.

Pyloroplasty is also to be recommended in suitable cases. The cases of gastroptosis that have been operated upon are reported as being greatly improved by the operation.

The importance of the effect of the acid gastric juice on the motility and secretion of the duodenum and also between the gastric secretion and the secretory functions of the intestine, pancreas, and liver, has been shown by Hirsch and von Mering, and confirmed by Pawlow. Bayliss and Starling have also shown the effect of the acid gastric secretion in the duodenum in that it excites the secretion of secretion. Therefore, in operations on the stomach, it is desirable, when conditions permit, to preserve the pyloric duodenal route.

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## THE DIAGNOSIS OF CARDIAC DISEASE.

BY

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At the present time the subject of cardiac disease is often slightly considered by the medical man. The utmost looseness prevails in diagnosis, and perhaps, in no other condition is it of such importance to make a *proper diagnosis*. Too often we hear from a medical friend that such and such a patient has heart disease. Heart disease—he might as well have said nervous disease or stomach disease without any qualifying phrase. When we speak of disease let us be explicit, or at least as explicit as our knowledge and the nature of the lesion will permit. If a positive diagnosis cannot be made let us at least make a tentative one and not call the condition heart disease, thus letting our minds slumber in peaceful ignorance and shameful bliss. Heart lesions are not so very hard to diagnose.

In the diagnosis of heart disease, sight, touch and hearing are the senses used, and it is difficult to limit to any a paramount importance. By sight we determine the following factors: 1. The general appearance of the patient and the presence or absence of the following: (1) Obesity, (2) cyanosis, (3) dyspnea, (4) visible pulsations, (5) tremors, (6) edemas.

After a view of the general features of the case we have the patient, if a man, remove his clothing from the chest, if a woman we have her remove all superficial garments, nothing but a light shirt covering the skin, and we use (except in occasional circumstances) the sense of touch instead of the sense of sight for the elucidation of the hidden points. The points which we may look for in a view of the bared chest are as follows: (1) The apex beat; (2) precordial pulsation—and we try and define the cycle of cardiac activity in which it occurs; (3) the state of the intercostal spaces during the two phases of respiration; (4) epigastric pulsation—and the time of it in regard to the cardiac cycle; (5) liver pulsation, and its time in regard to the cardiac cycle.

*Obesity.*—In the condition known as obesity, pathologic factors are at work reducing the organism to a state of lessened resistance and decay. In the obese, a fatty metamorphosis is taking place and fatty cells are being stored in between the fibers of muscle and connective tissue, nerve bundles, and epithelial cells. It would be well if the deposit would only occur between the cells but soon the deposit takes place in the cells themselves and we have a condition resulting of much potential danger to the organism, especially if the heart is the organ most affected. The heart, as we know, is composed principally of muscle fibers and owing to its great activity requires that the muscle be in a state of good physiologic activity. Should large masses of fat occur between the bundles a gradual lessening of its vitality results, and it becomes weak and unable to respond to sudden and heavy strains—consequently, some day during exertion the obese patient finds himself suddenly growing short of breath, he gasps and finds difficulty in breathing, at the same time he may experience a severe pain either over the area of the heart, or sometimes referred to the right side, slightly below the nipple. He may become faint, spots fly before his eyes, and on account of dyspnea he is unable to undertake any exertion. The cause of this phenomena is sudden acute dilation of the heart occurring principally on the right side—thus causing the pain under the sternum and the one referred to the right. We can verify the dilation by means of percussion, finding the heart, as is often the case, enlarged both to the right and the left of its normal position.

*Cyanosis* is of importance principally as indicating a heart that has lost its power of compensation. Only in one other cardiac condition is it present, *i. e.*, patency of the foramen ovale. Cyanosis is of course a prominent symptom in pulmonary disease, especially emphysema, but we must remember that the heart is closely related to this disease, both as a causative factor and also as a repository of many of the ill-results of the disordered pulmonary activity. The appearance of cyanosis always indicates that the heart is laboring beyond its

power and that rest, absolute as well as relative, is required.

*Dyspnea* is also a sign of an overworked heart. Let us examine into the causes of dyspnea and we will be better able to appreciate its significance. Every tissue of the body, for the purpose of katabolism (or oxidation, a division of metabolism) constantly requires a copious supply of oxygen. The only way the oxygen can reach the tissues is by entrance from the lung alveoli into the lumen of the bloodvessels and thence through the circulatory system to the part where it is needed. Air hunger or dyspnea occurs when the supply of oxygen to the tissues is deficient. The supply may be curtailed by: 1. The non-entrance of air into the alveoli, from certain pulmonary lesions—a good example being pulmonary emphysema (with this form of air hunger we shall not concern ourselves). 2. The nonabsorption of oxygen by the blood. This occurs in anemias and in certain poisonous states of the blood as in CO<sub>2</sub> poisoning. 3. The nondistribution of the oxygen by the blood, due to cardiac weakness.

With the last we are especially concerned. When this occurs, impulses from the starved tissues are sent to the central nervous system demanding more oxygen and the lungs respond by increasing the rapidity of the respiration, while incidentally the already overlabored and weakened heart has an additional burden thrown upon it and it increases the rapidity of its beat but at the same time it becomes very much weaker, and because of this relation we may deduce the rule that directly as the rapidity of the respiration, so is the rapidity of the heart, and inversely as the rapidity of the respiration is the strength of the individual heart beat.

*Visible Pulsations.*—In regard to invisible pulsation, the three points where we look for pulsation are: 1. The nuchal area. 2. The cardiac area proper. 3. The epigastric area. (See Fig. 1.) In the nuchal area (A) pulsation is due to, (1) carotid pulsation; (2) jugular pulsation; (3) aneurysmal pulsation; (4) transmitted pulsation from carotid or jugular (by a solid tumor, etc.); (5) tumors (angiose variety) of the thyroid.

The carotid pulsation in certain cardiac conditions is very marked as in aortic regurgitation. Here we have a marked pulsation with every contraction of the heart. This pulsation is sharp and quick and very forcible, and quickly recedes. To this variety of pulsation the name Corrigan or water-hammer is applied. Carotid

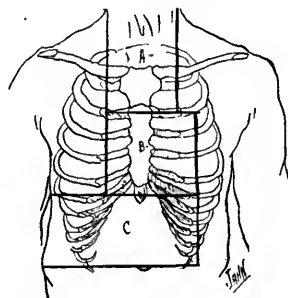


FIG. 1.—A, Nuchal area. B, Cardiac area proper. C, Epigastric area.

pulsation may be differentiated from jugular pulsation—chiefly from the fact that carotid pulsation occurs higher in the neck than the jugular which takes place immediately above the clavicle in the jugular bulb. The reason that the pulsation is not transmitted higher is that, at the superior limit of this bulb, a valve is placed which hinders the backward circulation of the blood beyond this point. Sometimes when varices occur, pulsation is transmitted from the arteries (carotids) through the varices into the veins (jugular).

Jugular pulsation occurs during diastole of the heart—in time it is presystolic and is synchronous with the contraction of the right auricle. Should a pulsation occur in the jugular during systole, we have present an insufficiency of the tricuspid valve of which it is a pathognomonic sign. The following sphygmographic (Fig. 2.) tracing of the normal jugular pulse shows a fairly slow rise, beginning in the systole of the heart and continuing until the auricular contraction when it makes a sudden ascent and then descends again immediately on systole. Should a tricuspid regurgitation be present, the fall does not occur during the systole of the heart but an additional rise, as shown in Fig. 3, takes place immediately following the auricular contraction—this, as stated

before, is a pathognomonic sign of an incompetent tricuspid valve.

Aneurysmal pulsations are heaving and expansile and with the stethoscope a peculiar bruit is noticeable. In case of aneurysm of any of the great vessels of the upper chest or neck, the pulse on the affected side is generally found to be retarded and at the same time weaker than on the sound side.

When there is transmitted pulsation from

Fig. 2.

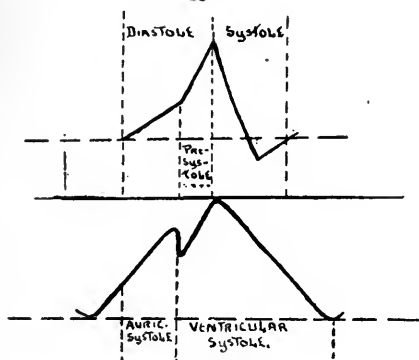


Fig. 3.

the carotids by solid tumors, we distinguish them (1) by their size; (2) noncontinuity with a bloodvessel; (3) no outward and inward pulsation; (4) generally are continuous with other growths.

Sometimes the thyroid is changed into an angiose variety of tumor, and here, as in all angiose tumors, pulsation is present.

Tremors bear a peculiar relation to cardiac disease—almost invariably they are found and possibly may be seen.

After an inspection of area A, we move on down to area B and here we observe (1) the apex beat; (2) precordial bulging; (3) precordial pulsation; (4) intercostal bulging or retraction during respiration.

The apex beat in a normal individual is in the fifth intercostal space, and is one inch to one and one-half inches below the left nipple and three-fourths of an inch internal to it and about three inches from the middle of the sternum. Sometimes the apex beat cannot be felt, for the following reasons: (1) The heart systole may be so weak that it does

not give any impulse to the chest wall; (2) the chest wall may be too thick, because of fat, to convey the impulse; (3) the impulse of the apex may take place beneath a rib and thus not be transmitted; (4) fluid may be present in the pericardium.

The apex beat may be moved in the direction of any quarter of the four quadrants, either above or below or to the outer or inner side of the normal, or a combination of any two of the above.

Apex is moved as follows:

1. Outward (directly) we have: (1) Hypertrophy (right heart); (2) dilation; (3) traction (left sided) on the heart by adhesions; (4) right sided—pleural effusion.

2. Downward: (1) Generally emphysema; (2) enteroptosis; (3) aneurysm of aortic arch; (4) tumors in upper part of mediastinum.

3. Downward and outward: Hypertrophy or dilation of the left heart.

4. Upward: (1) In childhood it is natural to have the apex beat in the fourth intercostal space; (2) in cases in which the intraabdominal pressure is elevated and the diaphragm rises into the chest, the heart likewise is pushed up into the chest. This occurs in (a) ascites; (b) tympany; (c) large abdominal tumors.

5. Upward and outward: This can only occur in conjunction with an enlarged left ventricle in conjunction with the greatly increased intraabdominal pressure or with traction upon the head by fibrous bands and adhesions.

6. Downward and inward: A very rare displacement and found in connection with left sided pleural effusion and an enlarged left ventricle.

7. Inward: (1) Left sided pleural effusion; (2) pneumothorax; (3) adhesions to the right side of the heart exerting traction on it, as in fibroid tuberculosis; (4) atelectasis of the right lung; (5) cirrhosis right lung; (6) tumor left lung.

8. Inward and upward: A combination of the causes of inward displacement in conjunction with elevation of the diaphragm from intraabdominal pressure due to (a) tympany; (b) tumor; (c) ascites.

The position of the apex, in relation to heart disease, is of paramount importance when it is moved from the normal in two directions, namely, downward and outward. This is only caused by dilation or hypertrophy of the left ventricle, or a combination of these two.

The diagnosis of dilation or hypertrophy which it is important to make, because the treatment of the two conditions is very different, may be made from the following:

**Hypertrophy:** Pulse, full, strong, generally regular. Blood-pressure, high. Heart impulse strong. Dyspnea, absent. Second aortic, strong. Cyanosis, absent. Precordial pulsation, present, it is strong and heaving and is felt over two or three interspaces.

**Dilation:** Pulse, weak, rapid, irregular. Blood-pressure, low. Heart impulse, weak. Dyspnea, present. Second aortic, weak. Cyanosis, may be present. Precordial pulsation, absent.

After noting the apex beat, etc., we examine the epigastrium [the epigastric area (Fig. 1.)] and note the presence or absence of pulsation.

Epigastric pulsation is due to the following:

1. High hyposternal angle—consequent direct transmission of the cardiac impulse.
2. Dilation and hypertrophy of the right heart in a normal chest.
3. Aneurysm of the abdominal aorta.
4. Neurasthenic or rather nervous lesions reflexing on the aorta.
5. Tumors in the abdomen transmitting the impulse.
6. Hypertrophy of left heart, producing a greatly increased pulsation in the aorta.

Pulsation of the liver may be defined by pushing one hand beneath the costal margin while the other hand presses down on the ribs—an expansile pulsation is now felt and if it is systolic may be due to (1) tricuspid regurgitation of which it is pathognomonic, or (2) transmitted pulsation from an enlarged right heart.

Quincke's sign of aortic insufficiency consists of pulsation of the liver and of the spleen.

After having elicited the chief signs seen on inspection, it is now necessary to use the art of palpation. The principal criteria found on palpation are:

I. In the cardiac area: 1. Thrills which are not of very great importance, they only

indicate a vibratory state of the part which is approximate to the area where the thrill is best felt. (See Fig. 4.) 2. Precordial friction fremitus, sometimes in case of plastic pericarditis a friction rib is present. This can be well heard over the cardiac area where the heart is in direct contact with the chest wall.

II. In the arteries: The rapidity of the pulse—often in cardiac disease when the musculature is intact and because of nonoxygenation of the tissues, the demand on the heart is increased and an increased rapidity of the pulse results. In case the musculature is not intact and the increased demand is still present, a

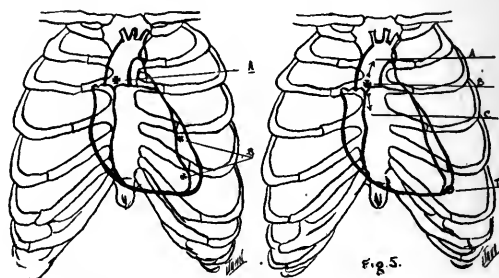


FIG. 4.

FIG. 4.—A, Aortic stenosis. B, Mitral stenosis.

FIG. 5.—A, Stenosis. B, Aortic murmur. C, Regurgitation. D, Mitral murmur.

slow pulse results. In fact in nearly all cases of cardiac degeneration the pulse is slowed. When dilation is present, the pulse is fast and at the same time is irregular. In hypertrophy (simple) when the compensation is perfect, the pulse is generally slow and very strong. The Corrigan or water-hammer pulse is almost a pathognomonic sign of aortic insufficiency.

Perhaps the most valuable means of cardiac diagnosis is auscultation, and the best means of auscultating is the stethoscope. In cardiac auscultation a stethoscope with a small bowl is preferable. The four principal points where we place the stethoscope are over the pulmonic, aortic, tricuspid, and mitral areas. The normal sound is *lub-dub*, and in diseased conditions one or both constituents of this sound may be replaced by a murmur, and we may have (*lub-sish* or *sish-dub*). If we have a murmur we then localize it as to time, that is we define in what cycle of cardiac activity it occurs,

whether it is synchronous with the contraction or systole or whether it occurs during the dilation or diastole. All murmurs at the cardiac vessel orifices occurring during systole are due to a narrowing or roughness of those orifices and a consequent retardation of the onward flow of the blood (a narrow stream being produced, a murmur takes the place of the normal sound), likewise a diastolic murmur at the cardiac vessel orifices is due to a backward leakage or an insufficiency at those orifices. The opposite is true in regard to the internal cardiac orifices, namely, the mitral and tricuspid, for here a systolic murmur indicates an insufficiency while a diastolic murmur indicates a stenosis. Murmurs are always propagated in the direction of the bloodcurrent. (See Fig. 5.) A regurgitant murmur is propagated backward while a stenotic murmur is propagated onward.

In the case of mitral murmurs they are heard best at the apex and are propagated toward the axilla, because the vibration from the diseased valve is carried to the apex through the heart walls and there is transmitted along the ribs to the axilla.

A diagnosis must not be made from murmurs alone, because many lesions beside valvular lesions produce a murmur, as anemia, etc. A point to be borne in mind is that the more dense the blood, the less the tendency to vibrate and the fewer murmurs will be formed.

Points of vast diagnostic significance in treating heart disease are those which indicate the beginning of a loss of compensation. Two of the best are Smith's syndrome, and Kratzenstein's syndrome.

#### INTERESTING POINTS IN DIAGNOSIS OF CARDIAC DISEASE.

*Delirium* in acute rheumatic fever should direct attention at once to the heart.

*Pains over heart* and radiating to the neck and arms are more frequent in aortic incompetency than in any other valvular disease of heart.

*Arterial anemia* (dyspnea, a giddiness, and paleness) more common in aortic insufficiency than in any other valvular lesion of heart.

*Organic and inorganic murmurs* (endo-

cardial organic murmurs; pericardial murmurs; functional incompetency; cardiorespiratory murmurs; cardiomuscular murmurs). Diagnosed by, (1) cause, (2) where heard, (3) character, (4) diagnostic points.

#### PATHOGNOMONIC SIGNS.

*Rotch's Sign:* Obliteration of angle at right fifth interspace in pericardial effusions.

Nonreduction in the area of superficial cardiac dulness by deep inspiration. (Pericardial effusion.)

Pearshaped outline (on percussion) base downward, apex upward. (Pericardial effusion.)

Pulse is strong but apex beat can with difficulty be felt or seen. (Pericardial effusion.)

*Bamberger's Sign:* When patient is sitting upright area of dulness about the size of a silver dollar at the angle of the scapula. On auscultation, tubular breathing is heard. On leaning forward the dulness and tubular breathing disappear to reappear when the upright position is again assumed. (Pericardial effusion.)

*Development of a murmur at mitral area* while the patient is under observation:—endocarditis—acute.

*Corrigan pulse* in aortic incompetency.

*Liver pulsation* in tricuspid insufficiency.

*Venous pulse tracings, jugular.* Normally pulsation is present in the jugulars beneath the jugular bulb and is due to the auricular contraction. Should the pulsation be double and the last pulse be synchronous with the ventricular systole, it would indicate that a regurgitation through the tricuspid valve was present. This is best seen by a sphygmographic tracing. This symptom is also found in patent foramen ovale; thoracic aneurysm communicating with great veins of neck. See Fig. 3.

*Broadbent's Sign:* Retraction of eleventh and twelfth ribs during systole of heart. This is found in mediastino pericarditis and is due to the traction exerted on the diaphragm and thence on the two lower ribs which are free by the adhesions uniting the heart to the pericardium, and thence to the diaphragm.

*Kratzenstein's Sign of Failing Heart:* Com-

press both iliacs; control the bloodpressure; control the pulserate.

1. Rise of 5-15 mm. Hg., no increase in pulserate—normal. 2. Rise of 5-15 mm. Hg., increase in pulserate, hypertrophy left ventricle. 3. No rise of pressure and increase in pulserate. 4. Lessening in pressure and increase in pulserate (cardiac insufficiency).

*Symptom of Failing Heart* (Smith p. 124): Have the patient exert himself smartly for a few minutes, then the number of beats in the next four or five quarters of a minute should be registered and compared. If the muscle is good the numbers will rapidly diminish with each succeeding 15 seconds, till the rate is regained which was previously present. If the increased frequency continues it is a suspicious circumstance against the muscle.

## VINCENT'S ANGINA: WITH REPORT OF CASES.\*

BY

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of Philadelphia.

In 1896, Vincent<sup>1</sup> described a spirillum and a fusiform bacillus occurring together in certain cases of angina of an ulcerative type. This was followed by reports of cases by Bernheim,<sup>2</sup> Mayer,<sup>3</sup> Royster,<sup>4</sup> Crandall,<sup>5</sup> A. Gross,<sup>6</sup> Toebben<sup>7</sup> and many others.

*Lesion.*—The lesion produced by the spirillum and fusiform bacillus is ulcerative in type, in contradistinction to that produced by the diphtheria bacillus. When the necrosis is superficial, the necrosed epithelium, on the surface, often hides the depth of the lesion, thus resembling diphtheria very closely. If the layer is removed a distinct ulceration will be seen. While, as a rule, the deposit is easily removed, as reported by Mayer, at times according to Auché,<sup>8</sup> only the superficial layer is friable, or as mentioned by H. W. Bruce,<sup>9</sup> the whole deposit may be hard to detach.

This deposit, however, is not due to the formation of a false membrane on the surface of the diseased area, but to necrosis of the superficial layers of that area with the formation of an ulcer. The ulcer varies in depth and extent, having

perpendicular edges which may or may not be injected, and presents many granulations which bleed easily.

H. W. Bruce<sup>9</sup> divides the process into two types, as follows:

*Mild Diphtheroid Type.*—This is generally unilateral, superficial, limited in extent, and gives no swelling nor injection of the fauces. There is slight glandular enlargement on the side of the lesion and a slight elevation of temperature lasting from 24 to 48 hours. There is no immediate change in the throat condition with the drop of temperature, but the slough finally drops off and an ulcer is revealed which quickly heals.

*Ulceromembranous Type.*—The condition spreads rapidly over a greater area and is much deeper. There is a slow separation of the slough in 10 to 14 days, during which time one-half of the tonsil or uvula may be destroyed, followed by granulations which bleed readily, and heal rapidly. There may or may not be injection about the edges of the ulcer according to the severity of the case. There may or may not be fever, and albuminuria is rarely present. Glandular enlargement occurs, but never goes on to suppuration as it does in the adenitis following or occurring with the streptococcic angina of scarlatina. This type may cause septic pneumonia and death, as in a case reported by H. W. Bruce.<sup>9</sup> One attack does not confer immunity from subsequent attacks as stated by Bruce<sup>9</sup> and shown by Case I in this report.

Mayer<sup>3</sup> states that endocarditis may also follow this disease.

*B. fusiformis* averages from six to twelve microns in length, being thick in the central portion and thinning out at both ends. There are flagella attached, one to each end and two to the sides, giving the bacillus an eel-like motion in a hanging-drop preparation, which, together with its reaction with Leishman's stain, has lead A. E. Wright<sup>10</sup> to think that this micro-organism is not of bacillary origin but has affinities with a trypanosome. It is stained by most of the common aniline dyes and often shows vacuoles and other forms of degeneration, but no spores are demonstrable. It does not

\*Read before the Pathological Society of Philadelphia, January 25, 1906.

grow readily upon ordinary culture media, either under aerobic or anaerobic conditions except, according to G. Angelici,<sup>11</sup> when cocci are added. The same observer also states that acetic acid favorably influences and sugars inhibit its growth. These bacilli often occur in pairs and frequently in groups. Angelici also states that this bacillus is the same as the *B. hostilis* of Seits and can be found in morbid processes throughout the alimentary canal.

*Spirillum*.—This is a faintly staining, wavy, long, thin, delicate microorganism, which stains with ordinary aniline dyes, but does not stain by Gram's method. It is considered by many to be a normal inhabitant of the buccal cavity only becoming pathogenic in the presence of other microorganisms.

These microorganisms may be found in pure culture in the diseased areas, especially in those of deep ulceration. When the ulceration is superficial, there is often a polymicrobial infection, the spirilla and fusiform bacilli being associated with streptococci and staphylococci. While de Stoecklin<sup>3</sup> claims that the presence of these microorganisms precludes the existence of *B. diphtheriae*, Vincent, Toebben,<sup>7</sup> and Auché,<sup>8</sup> have reported cases in which the three organisms were present and R. C. Rosenberger<sup>12</sup> has reported the organisms present in a case of noma. Both of the organisms have been found by Grenet<sup>13</sup> in cases that give no evidence of stomatitis.

The object of this paper is to report nine cases of this infection in children ranging from two to ten years, which occurred in the Children's Department of the Philadelphia Hospital during the summer of 1904. One of the positive smears was made from the throat of an apparently healthy child who showed no signs of ulceration nor disease of the throat, tonsils, tongue, cheeks, gums, nor lips. In all, smears were examined from 21 children and of these, eight showed the presence of the fusiform bacillus in association with Vincent's spirillum, and one showed the presence of the fusiform bacillus alone. In one case pneumococci were found in the smear from the throat while the spirillum and fusiform bacillus were found in

that from the gums. The other 12 smears were made from the throats of children in the same department but showed no signs of either of the microorganisms mentioned.

For brevity we will dispense with detailed accounts of primary histories and physical examinations of the patients, only giving their initials and the symptoms which they exhibited during this infection.

CASE I.—J. W. Female. During the course of the infection the patient had bronchopneumonia, so it is impossible to state to what extent her irregular temperature (which rose as high as 103.2° F.) was due to this infection. During the course of the pneumonia, the patient had two attacks of Vincent's angina, the seat of the first attack being upon the upper lip and lasting three days, being described in the history as an exudate. The seat of the second attack, which was a true angina, was upon the tonsils and pharyngeal pillars which were covered with yellowish ulcerated patches. The tonsils were swollen and injected. The patches disappeared first from the tonsils and then from the pillars. The tonsils then became reduced in size and the redness subsided. This attack lasted 22 days and there was no glandular enlargement.

CASE II.—J. D. Male. This patient had a slight elevation of temperature. There were a few patches of ulceration on the lips and bleeding from the gums. There was also a white superficial exudate on the tonsils. Examination of the smears from the tonsils showed the presence of pneumococci but no spirilla nor fusiform bacilli, while that of smears from the lips showed these microorganisms to be present. No glandular enlargement.

CASE III.—H. A. Male. In this case there was a sudden rise of temperature in the evening to 103° F., followed the next morning by a drop to 101.2° F., rising in the afternoon to 103.2° F., and dropping the next morning to 99.4° F., and then rising to 101° F., followed by a gradual fall to normal. Smears from the throat showed the presence of Vincent's spirilla and *B. fusiformis*. The postcervical glands were enlarged upon admission and showed no increase in size during the attack, which lasted four days.

CASE IV.—A. W. Female. There was a sudden rise of temperature to 102.3° F. followed by lysis lasting one week. During the first four days of the attack, the child was slightly comatose being aroused with difficulty, but during the remainder of the attack the child became much brighter. The sites of the lesions were the side

of the tongue, which presented a small patch, and the roof of the mouth, upon which were two smaller ones. During the first four days, the tongue was heavily coated. At the end of four days, the patches had entirely disappeared from the tongue and there remained only a slight reddening of the roof of the mouth. There was no increase of a previously existing glandular enlargement during the attack. Examination of smears from the tongue and roof of the mouth showed the presence of Vincent's spirilla and *B. fusiformis*.

CASE V.—M. A. Female. Examination of smears from throat showed presence of Vincent's spirilla and *B. fusiformis*. There was no rise of temperature.

CASE VI.—J. E. Male. Examination of smears was positive for spirilla of Vincent and *B. fusiformis*. No glandular enlargement. No fever.

CASE VII.—P. B. Male. Irregular temperature, first rising to 100.4° F., then falling to 98.4° F., again rising to 101° F., followed by drop to normal by lysis. No glandular enlargement. Smears from throat were positive for Vincent's spirilla and *B. fusiformis*. Attack lasted four days.

CASE VIII.—J. F. Male. Healthy child. Smears from throat showed presence of *B. fusiformis* but no spirilla.

CASE IX.—P. H. Male. Healthy child. Smears from throat showed presence of both Vincent's spirilla and *B. fusiformis*.

#### SUMMARY.

Of these nine cases, seven were of the superficial or mild diphtheroid type of Bruce, and two were in healthy children, smears from whose throats showed the presence of *B. fusiformis* and in one instance the association with the spirillum.

The diphtheroid type of cases began with sudden rises of temperature, reaching, as in Case III, an elevation of 103° F. The temperature then pursued an irregular course varying from 2°–3° F. in its course, or gradually dropping to normal as in Case IV. In all the cases showing fever, the temperature fell by lysis. The pulse and respiration rate followed the temperature curve. As a rule, the patient did not show any marked constitutional effects except in Case IV, this patient being comatose for the first four days of the attack.

The seat of the attack was on the lips, tongue, gums, cheeks, tonsils, or pharynx and in none

was there marked destruction of tissue. In none of the cases was there glandular enlargement except that which existed prior to the disease. In all the cases, the fusiform bacilli were in greater number than the spirilla thus fulfilling the claims of Bruce.<sup>9</sup> The attack lasted anywhere from four days, as in Case III, to 22 days, as in Case I, the ulcerative condition still persisting after the temperature had become normal.

My thanks are due to Dr. R. C. Rosenberger, director of the clinical laboratory of the Philadelphia Hospital, for assistance on these cases and for guidance in my references.

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## ELECTRICITY IN THE TREATMENT OF RHEUMATISM.

BY

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Rheumatism is an anomaly of assimilation, with insufficient oxidation and elimination. The nitrogenous elements are productive of a retarded nutrition. A defective hygiene combined with improper diet are the prominent causes of this form of arthritis.

By the elimination from the diet of red meats and alcoholic stimulants, and reducing to a minimum all articles of food containing sugar, the system is more quickly relieved of the rheumatic poison. The best dietetic results are produced from a free use of white meats, soups,

eggs, vegetables, milk, and fish, with a copious supply of plain or natural spring waters.

The electrotherapeutics of rheumatism are referable more specially to the subacute and chronic forms. Included under these two classes are the muscular and arthritic and gouty conditions. In electricity, we have the best and quickest methods of promoting oxidation and elimination, and at the same time removing and restoring function to the part.

In all rheumatic conditions, electricity as a means of treatment must be applied in two ways; first, constitutionally; second, locally. High-frequency and static currents with solenoids and resonators and ozenotherapy are specially applicable to the general condition. In considering and selecting the proper form of local electrization, we have at our disposal really five different modifications or phases of current, each one, perhaps, showing characteristic advantages and peculiarities of its own; direct, induced, static, sinusoidal, and combining the first two, the wellknown galvanofaradic forms of electricity. Both the general and local applications of electricity cause an increased activity to the animal cell, increasing the functional capacity by storing up nutritive energy, and causing glandular stimulation and elimination.

Having resorted to these several forms of electrical applications, and in gathering the results of other specialists in electrotherapeutics, a complete test has convinced me that the continuous, static, high-frequency and induced forms are the most reliable and permanent in their actions on the rheumatic condition. There is no question as to the d'Arsonval, or high-frequency current, producing metabolism when molecular conditions are enhanced and oxidation more complete. Constant and persistent articular pains will be relieved almost instantly by a high-frequency, or a continuous current. The continuous current is noted as a sedative agent, and when combined with the induced (galvanofaradic) the fibrous formations in joints are destroyed, and upon interrupting the current, the congestions are removed as a result of electric massage.

General, or constitutional galvanization, acts

as a tonic to the entire system, but decidedly so on the nervous structures. The direct and static currents are the most active stimulants of nutrition we have, and as malnutrition and malassimilation are present in all rheumatic cases, the organs of digestion, absorption, and elimination are forced to the proper performance of their functions. Insomnia being present in a number of cases, the application of the continuous current to the upper dorsal and cervical regions, and a direct or indirect static breeze, will produce a quiet and normal sleep. The usual irritability of temper so often present is soothed and calmed by the electrical metabolism produced on the sympathetic and general nervous systems.

The local treatment may be continuous or interrupted, or the combination, galvanofaradic. The slowly interrupted faradic current, when locally applied to an individual muscle, causes a contraction, and indirectly such contraction means more blood to the part and increased nutrition. When pain is present in the muscle, a galvanofaradic current would cause a contraction and at the same time decreased pain and soreness of the parts. If there is a fluid of a pathologic nature, or even commencing deposits, absorption can be effected by the local application of the current to the joint, or the inserting of needles attached to the cathode may be resorted to when the deposits are of a commencing calcareous or sodium urate formation.

Some of the few prominent local phenomena are as follows: 1. Pain in the various joints affected, which is exaggerated upon pressure. 2. Difficult movements in the joints, due, probably, to the inherent pain of the articulation and weakness of the contiguous muscles. 3. Pain and soreness of the muscles brought out by pressure and movement. 4. Atrophy of the muscles with diminished contractility. 5. Hydrarthrosis.

The general routine of treatment would be as follows: When there is much muscular involvement, a primary and secondary current from the faradic coil, of about three to five minutes' duration, should be applied directly to the

muscles. At first, use currents of minimum strength, the electrodes well moistened with a saline solution, and the current increased to the maximum power of endurance. This to be followed by weak interrupted faradic primary currents. If excessive pain be present, use the continuous current of 15 to 30 milliamperes. When the articulations are affected, galvanofaradic currents applied directly over the joints from 10 to 15 minutes. Labile currents following stabile applications are usually of high therapeutic results. The continuous current applied to the spine, the anode over the exit of the nerve from the cord, and labile applications of the cathode over the joints and muscles. Spinal galvanism with anode over the cervical vertebrae, and cathode on upper section of sacrum, using 20 to 35 milliamperes of stabile variety will be good treatment.

In the following cases reported, I have copied from my record book of treatment, and each case in its history will demonstrate the conditions of the patient, and the general plan of electrotherapy as applied thereto. In almost all cases of subacute rheumatism, at least two treatments per week are necessary, while the chronic cases require from four to six treatments weekly, and continued for some time. Avoid informing the chronic rheumatic of a month's electrical treatment as an infallible cure, as two to six months will be the nearest solution.

In October, 1903, Mr. D. J. was referred to me by a physician from Wilmington, Del., with the following history: Two years ago he was confined to bed for six weeks with inflammatory rheumatism. At that time all of the smaller joints in the body seemed to be enlarged and painful. After getting about and working, the muscles at times felt sore to the touch and became more painful during contractions. Mr. J. says that "a long-continued treatment with iron and potassium iodid got him in pretty good condition." His greatest annoyance now is the enlargement of the wristjoints, which comes on during the late winter and early spring, when the air is damp and chilly. His articulations are very painful on pressure, and in the movements of the hands, the wrists are exceedingly sensitive and tender. Some of the exten-

sor muscles of the right forearm were atrophied, and, as he expressed himself, "full of neuralgic pains."

This patient was treated with the continuous current, with an occasional recourse to a slowly interrupted primary faradic current to the muscles. Twenty milliamperes every day for three weeks, and then increased to 30 milliamperes three times a week, about 15 minutes at each sitting. Labile continuous currents were used to the extensors and flexors of both forearms. This treatment was continued for six weeks, with slight changes in the diet, no medicine or drugs of any kind being used. He has since reported to me several times. There has been no return of the previous trouble, and an absence of deposits in the joints or any deformity.

Mr. W. J. N., aged 41, a merchant from Allentown, Pa., was sent to me complaining of a "severe ache and pain" in the lower part of the back and upper region of the thighs. Had two previous attacks of rheumatism, this part of the back being most troublesome, so bad that he was compelled to remain in bed for some time. During the winter he went to Florida, where comparative relief and comfort were obtained, but upon his return in the spring, the muscles of the lower back became painful on pressure, and, at times, interfered with proper locomotion. Severe pain was experienced upon attempted rising from the bed in the morning.

A continuous current was applied to the back, the anode to the upper dorsal and cervical regions, and the cathode to the lumbar region. Eighteen to 30 milliamperes were used daily for about 12 minutes. Later on, the slowly interrupted secondary faradic current was used. When the pains had disappeared, gymnastic exercise of these muscles was ordered, and at the end of three months' treatment no tender spots or aches were present. Both stabile and labile currents were used on the back and thighs.

Mrs. M., aged 34, was sent to me in February, 1904, complaining of loss of power in the left leg, following an attack of rheumatism. Upon examination the muscles of the calf of the leg and also of the thigh were found to be very much atrophied, cold, and dry to the touch. Sensation was very much impaired. She experienced pain at all times in these wasted muscles, which became more intense when in bed and sitting erect for any length of time. She dragged the left leg when walking, necessitating the use of a cane. This woman was

sent to me with a diagnosis of "ruptured blood-vessel in the spinal cord." There were no reactions of degeneration, the continuous and interrupted currents both producing a good response. The static wave current was applied to the leg, the oscillations being not frequent, the treatments given daily from 15 to 20 minutes. After eight applications indirect static sparks were applied to the muscles of the leg, and the wave-current along the course of the spinal cord. The brush discharge was used to advantage in this patient, applied over the lumbar muscles of the back, which was also productive of diuretic effects.

No form of electrical applications will cause better manifestations in rheumatism than the wave-current and brush discharge; causing a prompt cessation from pain and a marked reduction in the swelling around arthritic joints.

Other cases could be quoted showing the effects of electrotherapeusis in these apparently intractable and annoying conditions; but I think that the foregoing statements, together with a practical demonstration as shown in the treatment of the cases mentioned, will serve toward a better understanding of the electrotherapeutics of rheumatism.

**Census of the Blind.**—The New York State Commission to Investigate the Condition of the Blind, which is undertaking an inquiry into the cause of blindness and the means to be taken to assist the blind, is engaged in the preparation of a census of all those so afflicted. It is requested that the names of all blind adults, children or infants be sent to the secretary of the commission, Mr. O. H. Burritt, Batavia, N. Y. It is the purpose of the commission to obtain data on which to make recommendations to the Legislature concerning the establishment of industrial schools for the blind.

**Medical Practice Bill in Massachusetts.**—An effort is being made by means of a bill now before the Massachusetts Legislature to restrict or stop altogether the practice of Christian science in that State. While this sect is not specifically mentioned in the bill, which provides simply for the control of the practice of medicine, it is so drawn up as to militate directly against the Christian science healers.

**A Voluntary Street Ambulance Association** was formed 25 years ago in Vienna. That year its services were required 2,000 times; last year nearly 30,000 times.

## SPECIAL ARTICLES.

### INTERIM REPORT ON TRYPANOSOMIASIS IN PORTUGUESE SOUTHWEST AFRICA.

BY  
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of Angola, Africa.

Published under the imprimatur of the American Society of Tropical Medicine.

As I have pointed out on other occasions trypanosomes of both man and animals in the high, cool tableland of Portuguese West Africa, have been difficult to find, and probably a smaller percentage of infections obtains than in lower-lying regions. I have, however, continued to examine, with this parasite in mind, the blood of a series of natives and also to examine the blood and tissues of whatever animals I could obtain. When trypanosomes were first demonstrated in birds and in man, I hoped to carry through at once a series of inoculation and cultivation experiments with the parasites. Pressure of other work has, however, prevented my completing such investigations and I have thought best, having published preliminary notes on the subject, to present this progress report of observations made to date, leaving the incompleting experiments to be detailed in a subsequent communication.

The district in which the following investigations were made, lies about Lat. 12° by Long. 16°. The altitude, at the point where the most of them were carried out, is 4,761 feet.

I do not know of any mention in medical literature of trypanosomes from West Africa south of the Coanza river prior to my communication dated July 25, 1905, and entitled "Preliminary Note on a Trypanosome. Found in the Blood of an African Dove (*Treron calva*)."

Later (September 14, 1905), I sent a second note, also of a preliminary character, entitled "Human Trypanosomiasis in Portuguese Southwest Africa" to the secretary of the American Society of Tropical Medicine in which I mentioned (beside the trypanosome just noted) two cases of human trypanosomiasis, the first of which was seen on August 19, 1905, and a second bird trypanosome found since the publication of the initial note.

The following table shows the number of species and the number of individuals of each species the blood of which has been examined for trypanosomes.

TABLE I.

No.	Name of animal studied.	Number of individuals examined.	Number of individuals affected.
1	Man .....	53	1
2	Monkey ( <i>Cynocephalus</i> ) .....	4	0
3	" ( <i>Cercopithecus</i> ) .....	7	0
4	Lemur .....	1	0
5	Bat .....	3	0
6	Cat .....	4	0
7	Dog .....	11	0
8	Rat .....	19	1
9	Ox .....	6	0
10	Goat .....	13	0
11	Sheep .....	4	0
12	Antelope ( <i>Cervicapra bohor</i> ) .....	2	0
13	" ( <i>Cephalolophus grimmii</i> ) .....	1	0
14	Pig .....	9	0
15	Horse and Mule .....	11	0
16	Owl ( <i>Athens perlata</i> ) .....	1	0
17	Wagtail .....	1	0
18	Crow ( <i>Heterocorax capensis</i> ) .....	1	0
19	Gray Parrot ( <i>Psittacus erithacus</i> ) .....	2	0
20	Green Paroquet .....	5	0
21	Dove ( <i>Treron calva</i> ) .....	9	2
22	Sand Grouse ( <i>Pterocles sp.</i> ) .....	2	0
23	Domestic Fowl .....	8	0
24	Ox Bird ( <i>Buphaga africana</i> ) .....	1	0
25	Plover .....	1	0
26	Sand Lizard ( <i>Acontias maleagris</i> ) .....	4	0
27	Snake ( <i>Viper</i> ) .....	1	0
28	Frog .....	6	1
29	Tree Frog .....	1	0
30	Brook Fish ( <i>sp.?</i> ) .....	13	0
31	Snail .....	3	0

The following table shows the number of species of trypanosomes found and the species and number of individuals of each species of animal infected by them.

TABLE II.

No. of species of trypanosomes	Name of infected animal.	No. of infected individuals studied.
1	Wild Dove ( <i>Treron calva</i> )	2
2	Man .....	3
3	Rat .....	1
4	Frog .....	1

## DESCRIPTION OF TRYPANOSOMES FOUND.

*Trypanosome* 1.—This trypanosome (see Plate II, Fig. 7) resembles rather closely *Tr. avium*, Danlewsky. Slight differences from the typical form might be said to exist but as I have not yet made cultivation experiments to determine if its cultural forms bear out these delicate distinctions, I class it for the present with the species above mentioned with which it will probably prove to be closely related if not



FIG. 1.—Map of South Africa. The shading shows the district mentioned in this report.

identical. The trypanosome as seen in the blood of the wild dove is a plump fish-shaped body, rather sharp at the posterior end. Faint longitudinal striæ or myonema lines can be made out in the protoplasm as well as very fine granules. The nucleus extends about two-thirds across the body and seems almost completely to fill the space in which it lies. The flagellum and undulating membrane are wavy in very regular curves. The free flagellum is comparatively short. Following are the principal measurements of a stained specimen: Length (about), 28 microns; greatest width, 9 microns; distance of centrosome from posterior end, 4 microns; length of free flagellum (about), 8 microns; longest diameter of nucleus, 6 microns.

*Trypanosome* 2.—This trypanosome (see Plate I, Figs. 1-2) seems to be morphologically identical with *Tr. gambiense*, Dutton. The posterior end is truncated and the arrangement of the centrosome, nucleus, and flagellum as well as the "set" of the organism on the slide correspond closely with the same points in *Tr. gambiense*. The protoplasm stains somewhat irregularly with Romanowsky, taking on a

basophile reaction. The centrosome stains a dark purple hue and the flagellum (which stains pink) seems to rise from or near it. Anterior to the centrosome lies the vacuole. The nucleus lies near the middle of the body and often occupies more than two-thirds the width of the parasite. It is oval in shape and stains red like other chromatin material. Following are the measurements of a stained specimen: Length (about), 24 microns; greatest width, 3.5 microns; dis-

microns; greatest width, 8 microns; distance o centrosome from posterior end, 17 microns length of free flagellum (about), 18 microns largest diameter of nucleus, 3.5 microns.

#### CASES OF HUMAN TRYPANOSOMIASIS.

CASE I.—This is the case mentioned in my preliminary note on human trypanosomiasis. Name. Chimbomba. Age, 30. Sex, male. Race, Bantu (Chiyaka tribe).

History.—This man was examined in an unselected series of natives. Gave no history of illness except occasional slight fevers. Has

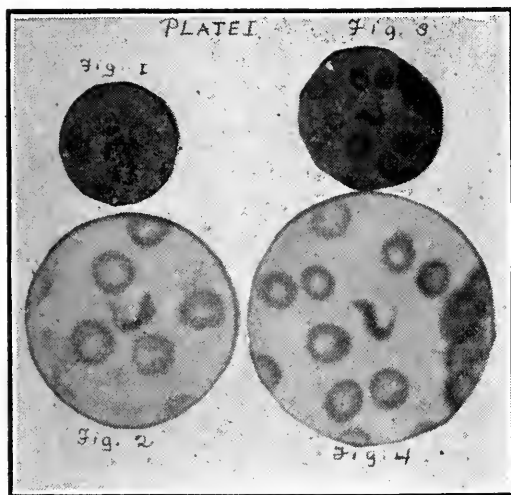


PLATE I.

FIGS. 1 and 2.—*Tr. (?) gambiense* in man.  
FIGS. 3 and 4.—*Tr. (?) gambiense* in dog.

tance of centrosome from posterior end, 3 microns; length of free flagellum (about), 9 microns; largest diameter of nucleus, 4 microns.

*Trypanosome 3.*—(See Plate II, Figs. 5-6.) Very probably *Tr. lewisi*. No differences in structure from those characteristic of that species can be made out in my specimens. The slender contour and narrow undulating membrane are well shown. I give measurements of a stained specimen. Length (about), 25 microns; greatest width, 2 microns; distance of centrosome from posterior end, 4 microns; length of free flagellum (about), 10.5 microns; largest diameter of nucleus, 3 microns.

*Trypanosome 4.*—(See Plate II, Fig. 8.) Resembles rather closely *Tr. mega*, Dutton and Todd. This same parasite or a very similar one has also been found on the Congo. The distinguishing points of this trypanosome are the great size, the longitudinal markings, the great distance of the centrosome from the posterior end, the ill-defined nucleus and the tortuous flagellum. Following are the measurements of a stained specimen: Length (about), 60



PLATE II.

FIGS. 5 and 6.—*Tr. lewisi* in rat.  
FIG. 7.—*Tr. (?) avium* in dove.  
FIG. 8.—*Tr. (?) mega* in frog.

frequently been in Esupua (the tsetse fly belt of the district).

*Condition when Examined.*—There were no symptoms whatever that would lead one to suspect trypanosomiasis. The temperature was normal. A hematokrit of the blood showed about 5,000,000 red cells and 7,000 leukocytes. A feces examination revealed only the presence of a few ova of *Ascaris lumbricoides*. Urine

NOTE.—Specimens of each of the trypanosomes figured have been sent to the secretary of the American Society of Tropical Medicine with this report.

normal. A differential leukocyte count showed the following results:

About 500 cells counted. Polymorphonuclears, 31 percent; lymphocytes, 25 percent; large mononuclears, 24 percent; transitional, 7 percent; eosinophiles, 13 percent.

I have frequently seen as great a proportion of large mononuclear and eosinophile leukocytes as this count shows in West African Bantus enjoying the best of health. Trypanosomes were abundant in the peripheral circulation and in preparations obtained by aspirating the cervical lymphatic glands, which glands, however, were not enlarged and seemed in other respects normal. The man would not consent to lumbar puncture so I was not able to examine the cerebrospinal fluid.

CASE II.—Name, Wele. Age, 23. Sex, male. Race, Bantu (Chiyaka tribe).

*History.*—Had suffered for several months with irregular fevers which were milder and rarer at the time I saw him than they had been formerly. He has frequently been in the fly belt (Esupua).

*Condition when Examined.*—Patient was thin and there was marked edema of the eyelids. The skin was harsh and dry. A papular eruption somewhat resembling recently acquired scabies was present on the back, arms, and thighs. The cervical glands of the right side were very slightly enlarged. Tongue was coated, pointed, and tremulous. Feces contained ova *Uncinaria* and *Ascaris*. Urine was normal. Several large blood films were searched and one typical trypanosome was seen with several pear-shaped undifferentiated forms. Only fresh films were available and the patient could not be persuaded to leave his village.

CASE III.—This case was reported to me by Mr. W. E. Fay, of Chilume, a place three days distant from the point where this paper is written.

Name, Kasoma. Age, 28. Sex, male. Race, Bantu (Bailundo tribe).

*History.*—About one year ago he had fever and pains in the bones of the legs for several weeks. Has been well since. Has often been in Esupua.

*Condition when Examined.*—Blood showed infection with malarial parasites as well as trypanosomes. Spleen enlarged, reaching half way to the umbilicus. Face showed a puffy appearance caused by slight edema. No skin eruption. In other respects the man was in good health and condition.

## INOCULATION EXPERIMENTS WITH *Tr. (?) GAMBIESE*.

Animals suitable for inoculation experiments were very difficult to obtain. Monkeys, guinea-pigs, etc., were impossible to procure. The following animals were inoculated from Case I: 1. Three dogs. 2. One goat. 3. One rat.

The rat died the ensuing night. The goat and two of the dogs (a pure bred English fox terrier and a dachshund from Germany) showed no evidences of infection and no trypanosomes could be found in their blood. The third dog (a mongrel) showed parasites at the end of one week, but evinced no signs of illness and retained its condition perfectly. Small pear-shaped forms (see Fig. 2 f.) were also seen in its blood. The parasite as seen in this dog showed on the whole a blunter and plumper contour than



FIG 2.—Camera lucida outlines showing (a-b) different positions assumed by *Tr. ? gambiense* in stained preparation; f, pear-shaped developmental form.

it assumes in the human subject. (See Plate I, Figs. 3-4.) This dog escaped a few days after the parasites appeared in its blood and was never found. It was found impossible in view of the disadvantageous circumstances under which I worked to make cultivation tests. These, with fuller inoculation experiments, I hope to carry out at some future time.

## POSSIBLE CARRIERS OF TRYPANOSOMES IN THE DISTRICT.

1. In view of recent researches it is probably safe to say that the local spreader of human trypanosomiasis is the only tsetse fly of the district, *Glossina palpalis wellmani*, Austen (*sub-sp. nov.*). The "fly belt" of the region through which all porters from the interior must pass in order to reach the coast, and which swarms with *Gl. palpalis wellmani*, is at a point called Esupua. In all three cases of human trypanosomiasis I have mentioned, the patients gave the history of having been frequently in Esupua. I hope shortly to publish a detailed study of the morphology and bionomics of *Gl. palpalis wellmani*, and shall not, therefore, include here what can be better and more fully treated in a separate

paper, and what from its importance deserves special discussion.

2. The hemophagous larva of *Auchmeromyia luteola*, Fabricius, is of possible interest in connection with the general subject of trypanosomiasis in mammals. I have recently published a study of this fly (with drawings) and refer the reader to my paper mentioned in the bibliography appended to this report.

3. The Ochiopio Tick (*Ornithodoros monbata*, Murray) may also be mentioned here. It has been proved to carry *spirochaetae* and should not be lost sight of, as it preys on all warm-blooded animals. I have described and figured this tick in another place (see bibliography).

4. *Tabanidae* and other biting flies. Observations in India and the Philippines on animal trypanosomiasis forbid us to exclude biting flies other than *Glossinae* from an account of the possible transmitters of the disease. The *Tabanidae* of this region are quite peculiar to themselves and my collections contain a number of flies new to science. These are of the species *Tabanus*, *Hæmatopota*, and *Chrysops*. One common *Tabanus* is *T. rubeicundus*, Walker, or a closely allied species which I figure below (Fig. 3) and another is probably a new species

1. Trypanosomiasis of *Batrachia*, birds, rodents and man extends at least as far south on the west coast of Africa as Benguella.

2. The species found in southern Angola at an elevation of nearly 5,000 feet differ very slightly as regards morphology from those found on the coast farther north (Gambia, Congo).

3. About three natives out of every 500 in southern Angola show in their blood a trypanosome which is *Tr. gambiense* or a closely allied form.

4. The clinical symptoms of such trypanosomiasis are mild and ill defined. (No cases of sleeping-sickness originating in the district have been seen.)

5. Other animals (dogs) are susceptible to artificial infection with this human trypanosome. The symptoms of such infection in dogs are probably very slight or wanting.

6. The probable carrier of the human trypanosome is *Glossina palpalis wellmani*, Austen (*sub.-sp. nov.*)

7. The transmitters of the frog, bird, and rat trypanosomes are as yet undetermined.

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Broden: Les Trypanosomes des Grenouilles. Arch. f. Schiff's u. Trop.-Hyg., Jan., 1905, p. 18.

Dutton: Note on a Trypanosoma Occurring in Blood of Man. Paper read at meeting of Brit. Med. Assn., 1902.

*Id.* and Todd: First Report of the Trypanosomiasis Expedition to Senegambia, Thompson Yates Lab. Rep., Vol. v, 1903.

*Id.*, *Id.*, Christy, Thomas and Linton: *Ibid.*, Vol. vi, 1905.

Forde: Some Clinical Notes on a European Patient in whose Blood a Trypanosoma was Observed, Jour. Trop. Med., Sept. 1, 1902, p. 261.

Novy and MacNeal: On the Trypanosomes of Birds, Jour. Infect. Dis., Mar., 1905, p. 256.

Petrie: Observations Relating to the Structure and Geographical Distribution of Certain Trypanosomes, Jour. Hyg., Apr., 1905, p. 191.



FIG. 3.—*Tabanus ?rubeicundus*, Walk.

(near *latipes*, Macq). Ten or a dozen species of *Hæmatopota* have been collected most of which are new. The other Tabanid fly of the region is *Chrysops* of which there are several species not yet determined. I should not neglect, while speaking of biting flies, to state that several species of Stomoxys are common.

#### CONCLUSIONS.

The main results of the foregoing investigation may be briefly stated as follows.

Ruata: Trypanosomiasis in Man, Jour. Trop. Med., May 16, 1904, p. 147 *et seq.*

Smedley: The Cultivation of Trypanosomata, Jour. Hyg., Jan., 1905, p. 24.

Wellman: Preliminary Note on a Trypanosome Found in the Blood of an African Dove (*Treron calva*), Jour. Trop. Med., Oct. 2, 1905, p. 285.

*Id.*: Human Trypanosomiasis in Portuguese, Southwest Africa (Preliminary Note).

*Id.*: Observations on the Bionomics of *Auchmeromyia luteola*, Fabr., Entomological News, 1905.

*Id.*: On *Ornithodoros moubata*, Murray: A Disease-bearing African Tick., Medicine, 1906.

## SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.

Proceedings Reported by the Secretary,

WILLIAM J. GIES, PH.D.,

of New York.

The nineteenth meeting of the Society for Experimental Biology and Medicine was held in Schermerhorn Hall, Columbia University, in New York City, on Wednesday evening, December 19, 1906. The President, Simon Flexner, was in the chair.

*Members Present.*—Auer, Beebe, Burton-Opitz, Calkins, Davenport, Emerson, Ewing, Flexner, Foster, Gies, Hatcher, Lusk, Mandel (A. R.), Meltzer, Meyer, Morgan, Noguchi, Norris, Sherman, Shaffer, Torrey, Wolf, Yatsu.

*Members Elected.*—Alexis Carrel, Winfield S. Hall, William Opühls, H. Gideon Wells.

### ABSTRACTS OF ORIGINAL COMMUNICATIONS.<sup>1</sup>

*An Experiment on the Localization Problem in the Egg of Cerebratulus.*—NAOHIDE YATSU.

The author found that the third cleavage does not always separate the entodermic stuff from the ectodermic, so that the embryo from the animal half sometimes invaginates and sometimes does not. But by shifting the third cleavage plane to the equator by compressing the egg immediately after the first division (in doing this, the second cleavage is suppressed until pressure is relieved, the third cleavage of the normal egg appearing next to the first) and by separating the animal half from the vegetative, the former always gave rise to the embryos without gut, anenterons. From this it may be concluded that in the egg of *Cerebratulus lacteus*, a little before or at the time of the third cleavage,

the entodermic basis extends farther above than that of *Cerebratulus marginatus*.

*Experiments upon the Total Metabolism of Iron and Calcium in Man.*—H. C. SHERMAN.

Each of the experiments was of three days' duration and the same healthy man served as subject throughout. On a diet of crackers and milk which furnished 0.0057 gram iron and 2.65 grams calcium oxid (Exp. I), there was equilibrium with respect to iron, and a storage of calcium. When the diet consisted of crackers and egg-white with 0.0065 gram iron and 0.14 gram lime (Exp. II), or of crackers alone with 0.0071 gram iron and 0.13 gram lime (Exp. III), there were losses of both iron and calcium. These losses occurred through the intestine, but were evidently not due to intestinal putrefaction, since the ratio of sulphur in ethereal to that in simple sulfates in the urine was determined in Exp. III and found to be as 1:25. The results appear to confirm the suggestion of Von Wendt that a deficiency of calcium in the diet may lead to a loss of iron as well as of calcium from the body. There was a slight tendency toward diarrhea in each of the periods in which loss of iron and calcium occurred. The iron requirement evidently varied greatly, the average daily output for three experiments being 5.5, 8.7 and 12.6 milligrams respectively. The lime requirement was found by further experiments (IV and V) to be about 0.75 gram of calcium oxid per day.

*The Cause of the Treppe.*—FREDERIC S. LEE.

The treppe is usually ascribed to increased irritability caused by activity. The cause of the increased irritability has remained obscure. In studying the depressing action on muscle of its fatigue substances the author often observed augmentation of activity instead of depression. A more careful investigation of this phenomenon shows that it may be produced by all of the three recognized fatigue substances—namely, carbon dioxide, monopotassium phosphate, and paralactic acid. When a muscle is irrigated with an indifferent fluid containing one of these substances in small quantity, and compared with its mate irrigated only by the indifferent fluid, a fatigue record being made from both, more intense contractions frequently occur in the poisoned muscle at the beginning of the experiment, and may last until exhaustion sets in. When a fatigue record is being made from a muscle with the circulation intact, intravenous injection of a fatigue substance causes augmentation of contraction. The author concludes that the treppe is due to the augmenting action of fatigue substances in small quantities—the

<sup>1</sup>The abstracts presented in this account of the proceedings have been greatly condensed from abstracts prepared by the authors themselves. The latter abstracts of the communications may be found in Number 2 of Volume IV of the Society's proceedings.

same substances which in larger quantities cause depression or fatigue.

An excellent mode of demonstrating the augmenting action of CO<sub>2</sub> in the cat is to record the contractions of the tibialis anticus in the living animal, and while the record is being made, to clamp the trachea. A marked treppe follows.

If two corresponding muscles be compared, one with the circulation intact, and the other with its arteries ligated, the latter muscle performs more intense contractions and exhibits a more rapidly developing treppe, owing to the accumulation of fatigue substances.

The chemical theory of the treppe is able to explain several other known phenomena.<sup>6</sup> The author has experimented on both frogs and cats. The augmenting action of the fatigue substances seems to be observed even when curare is employed.

*The Influence of the Red Corpuscles upon the Viscosity of the Blood.*—RUSSELL BURTON-OPITZ.

After determining the coefficient for fresh ox serum at 37° C., the serum was gradually concentrated by the addition of definite quantities of red blood-corpuscles (washed). The viscosity of the "blood" was tested after each addition of corpuscles.

The following data may serve as examples:

	Spec. Grav.	No. of Red Corpuscles.	Viscosity Coefficient.
Serum.....	1.0248		2397.7
S+30 cc. corp.....	1.0382	4,000,000	1442.9
S+30 cc. corp.....	1.0467	4,700,000	1009.3
S+30 cc. corp.....	1.0524	5,700,000	851.6

Thus, the increase in the number of red corpuscles caused a corresponding increase in the viscosity. It is also obvious that the red corpuscles constitute the principal factor in determining the viscosity of the blood.

*A New Recording Stromuhr, with Demonstration.*—RUSSELL BURTON-OPITZ.

The cylinder of this stromuhr is placed horizontally and carries below its floor a valve, by means of which the inflowing blood can be diverted alternately into the right and left halves of the instrument. The piston within the cylinder moves back and forth, therefore, in a horizontal direction and records its movements by means of a pulley arrangement and a writing lever upon the smoked paper of a kymograph.

On account of its great sensitiveness, and the possibility of low adjustment, this stromuhr is especially fitted for measuring the blood flow in the veins.

The instrument has been used by the author

in testing possible vasomotor reactions in the pulmonary circuit. It was connected with the vein draining the middle lobe of the left lung. The nerves in the vicinity of the ganglion stellatum were stimulated. So far the experiments have given negative results.

*The Influence of Gelatin upon the Viscosity of the Blood.*—RUSSELL BURTON-OPITZ.

Solutions of gelatin (1000:50) were introduced intravenously after the normal viscosity of the blood had been determined. It was found that the injections resulted in a very prompt increase in the viscosity. The following data may serve as examples:

Specific Gravity.		Viscosity.	
Before Inj.	After Inj.	Before Inj.	After Inj.
1.0565	1.0543	836	772

*The Hemolytic Effects of Organ and Tumor Extracts.*—RICHARD WEIL (by invitation).

The author has found that the cause of the variability in the hemolytic effect of organ extracts, which has been noted by previous observers, is the varying admixture of blood. Kidneys prepared bloodlessly, by perfusion with salt solution, are hemolytic only in very low dilution, and after a long latent interval. Kidneys suffused with blood are as a rule very much more active; occasionally less so. The effects of blood have been analyzed by the separate addition of serum, emulsions of white cells (from artificial abscesses), and of red cells after washing, to the bloodless kidney extract. In each case it was found that hemolysis was inhibited. The question therefore arises, why are kidneys, suffused with blood, as a rule more actively hemolytic than the bloodless organs? If their extracts are centrifuged, and all the solid particles, including the red cells, removed, it is found that the extracts are still deeply stained by hemoglobin. This is due to the destruction and solution of red cells, which is inseparable from the process of preparing the extract. The next step, therefore, was to determine the effect of adding red cell constituents to the bloodless organ extracts. This was prepared by adding red cells to distilled water, and then bringing the solution to the strength of normal salt solution. Such a solution adds very markedly to the hemolytic power of the organ extract. Its manner of action seems to resemble that of complement, inasmuch as it is capable of breaking up the red cells only after a preliminary treatment with the organ extract.

Tumors were investigated in the same manner as the kidneys. It was found that the non-necrotic tumors are somewhat more hemolytic

than are the kidneys, owing possibly to their blood content. They act, however, in other ways precisely like the latter, their action being diminished by the addition of serum and of white cells, and being increased by the red cell extract.

Necrotic areas of tumors are extremely hemolytic, even up to dilutions of 2 to 400. This hemolytic activity is not affected by the addition of the blood components.

*The Enzymotic Properties of Diplococcus Intracellularis.*—SIMON FLEXNER.

The brief vitality of many of the cultures of *Diplococcus intracellularis* is a point of differential importance. Many strains, grown on a favorable medium, unless transplanted to a fresh medium do not survive beyond two or three days. Cultures three days old show marked degenerations and the latter increase rapidly with age until at the end of five or six days, or even earlier, no normal cocci persist. As degeneration progresses, loss of staining power and disintegration ensue, until finally, staining capacity is lost and a formless detritus remains.

The changes in the diplococcus are associated with the action of an enzyme which brings about the disintegration. This enzyme does not exhibit the usual properties of a proteolytic ferment; it does not liquefy gelatin or coagulated serum. The degree of rapidity of its action varies with its concentration; at least a heavy suspension of the cocci in salt solution, kept at 37° C., undergoes dissolution more rapidly and completely than a weaker suspension. The vitality of the cultures is associated with the degree of autolytic alterations in the suspensions; cocci in the weak suspensions survive longer than in the stronger ones. At lower temperatures—2° C.—disintegration of the cocci either does not take place at all or progresses much more slowly. Under the latter conditions more cocci survive in the strong than in the weak concentrations, although even here the vitality is a brief one.

The enzyme of the diplococcus acts energetically upon other bacteria, bringing about their dissolution. It acts upon *B. typhosus*, *B. coli communis*, *B. pyocyaneus*, *B. anthracis*, *M. catarrhalis*, and to a less degree and more slowly upon *Staphylococcus aureus*.

*On the Supposed Existence of Efferent Fibers from the Diabetic Center to the Liver.*—J. J. R. MACLEOD and C. E. BRIGGS.

The authors have found that no hyperglycemia is produced by stimulation of the splanchnic nerves, or of the spinal cord below the cervical region. In the cervical region, on the other

hand, stimulation produces hyperglycemia except when oxygen is very freely delivered into the trachea. By such administration it has been shown by Hirsch that the blood remains arterial even after the respiratory movements have been inhibited by curare. When the cervical spinal cord is stimulated, and especially when it is cut, the respiratory movements are very considerably interfered with so that a partial asphyxia is produced which may be the cause of the hyperglycemia.

The fact that stimulation of the cervical cord causes glycosuria cannot, therefore, be taken as a proof of the existence of efferent fibers which control the glycogenic function of the liver. Dyspnea may be the cause of the hyperglycemia in these cases.

Regarding the other evidence, which is supposed to point to the existence of such fibers, the authors stated that in all the experiments on which it is based (*viz.*, cutting the splanchnics, or sympathetic chain, or certain roots, or the spinal cord) there must have been induced by the operation a great fall of blood-pressure, which, in the cases of dogs with vagal glycosuria, Macleod and Dolly have shown usually causes a marked depression in the reducing power of the urine (*loc. cit.*).

*Conclusion.*—When every precaution is taken to prevent asphyxia the authors have been unable, so far, to demonstrate the existence of any efferent fibers whose stimulation causes hyperglycemia.

## DIGEST OF LITERATURE.

### EPITHELIOMA OF THE LIPS.

BY

CHARLES GREENE CUMSTON, M. D.,  
of Boston, Mass.

Labial epithelioma is relatively frequent, representing according to Womer 32.4 percent of operable cancer. According to Czerny 75 percent of malignant neoplasms are inoperable and, as an example, in Germany 40,000 subjects die annually from this disease. The relative paucity of publications relative to this subject is to be explained by the difficulty experienced in making an inquest on the ulterior fate of patients operated on, a great number of whom are treated in the outpatient departments.

Epithelioma is far more frequent on the lower than on the upper lip; thus epithelioma of the lower lip is according to Fricke 19 times, and according to Loos 17 times more frequent than

*L. - 17*

on the upper lip. Many authorities say that they have never met with a case occurring on the upper lip. The disease is far more frequent in man than in woman and out of 100 cases operated on by Kocher, Wartmann found only 13 women and this figure is practically the same as given by French authors, who admit that epithelioma of the lip in women is as one is to 7.6 in the male. In this statistics Fricke shows that 7.2 percent of the patients were women, while Womer places it at 9.6 percent and Janowsky at 10 percent.

Although women enjoy a greater immunity to labial cancer of the lower lip, the same cannot be said for the upper lip, because they are affected with epithelioma here seven times more frequently than men; consequently cancer of the lower lip is to be met with in the female, a claim which is quite in contradiction to what other authorities have stated. Dupré mentions the case of a patient living in the mountains and who often remained alone at home; she smoked a pipe and had a cancer of the lower lip. I myself have seen one instance of epithelioma of the lower lip in a puella publica, 35 years of age, who was addicted to smoking cigarets. She presented patches of leukoplasia on the left side of the lower lip, while on the right a small epitheliomatous growth was present. Histological examination of the neoplasm after excision proved it to be epithelioma. These two cases would seem to show the etiologic influence of tobacco to which we will again refer.

The nature of living may favor the development of epithelioma of the lips and it is quite remarkable that women are usually quite tolerant of the various irritations of the lips to which men are exposed, namely liquor and tobacco. The reason for this difference between the two sexes has not as yet been explained and one is obliged to admit hypotheses which are preferably left unsaid. Old people form the largest number of subjects afflicted with epithelioma of the lips. Young patients are extremely rare, although some cases in adolescents have been observed. Gangolphe operated on a subject 14 years of age and Tripiér had another similar case. Wartmann<sup>1</sup> gives the following table of ages in his 100 cases:

22	patients from	70	to	80	years.
37	"	"	68	"	70
28	"	"	50	"	60
8	"	"	40	"	50
5	"	"	30	"	40

The youngest was 30 years of age.

The frequency is greater between 60 and 70 years, it increases from adolescence to 60 and then progressively diminishes after 70 years. These figures are in accord with those given by Fricke, who admits as a mean age 60 years. Loos<sup>7</sup> believes that the disposition to the affection increases up to an advanced age.

As to heredity, most authorities are in accord that in this disease it plays a much lesser part than in other cancerous affections. Fricke collected 1,338 cases reported by Koch,<sup>5</sup> Womer, Maiweg, Regulski, plus 137 cases from the Gottingen clinic and only found 28 in which heredity could be established; and furthermore it must be said that the larger number of these were extremely uncertain. Out of 100 cases Wartmann<sup>1</sup> only found four in which heredity could be discovered; three stated that their father had had epithelioma of the lip and in the remaining one it was noted that the mother had died of carcinoma of the esophagus. Heurtaux had collected 11 instances in which there was a history of heredity. It should, however, be pointed out that the absence of heredity is not always sufficient to eliminate this factor, because these patients are usually old with an imperfect memory and also that cancer of the digestive tract, which is at present so frequently operated on, was formerly lost as far as statistics are concerned, because neither autopsy nor operation showed its existence in an absolute way. There is consequently a certain number of patients who reply negatively to the question relative to neoplastic antecedents in their ascendants, when in reality the latter may certainly have died from cancer of the digestive tract.

There is no profession which appears to particularly favor the development of this disease, but certain European authorities have upheld that men who feed poultry are very likely to be attacked by it. Volkmann has shown that the products of combustion which occur in the preparation of paraffin have an irritant action on the lips which favors the outbreak of epithelioma.

It is generally admitted that country folk are more exposed than others. Loos<sup>7</sup> and Janowsky<sup>4</sup> were unable to prove this statement by figures, while Fricke states that 75 percent of patients have either been occupied in caring for cattle or in agriculture. The French authors share this opinion.

Excoriations of the lips being more especially the consequence of the action of bad weather, it is quite natural to find them more frequently in people who work in the country than in those of the city and it is well known that these lesions

of the lips favor the development of epithelioma.

Berg  
and  
the  
Malignant disease of the lips is rare in Norway and Prussia and the same may be said of Sweden according to Rossander. From 1850 to 1859 there were 10 cases of epithelioma of the lips out of a total of 2,200 operations. The disease is frequent in England and especially in France, particularly in the central portion of the latter; according to Lortet it is rare in Asia Minor and in Oriental Europe, while in Africa it is unknown. All this may perhaps prove the influence of climate. The lack of care of the mouth and uncleanliness should also be noted. Epithelioma of the lips is, everything taken into consideration, more frequent in the working class than in the higher walks of life. Many people afflicted with herpes, or other trifling lesions of the lips irritate them by scratching or picking them; the result is that excoriations occur which transform malignantly, and certain people have the unfortunate habit of continually biting the borders of their lips. Dental caries, especially when present in the upper canine, may produce cancer by continued traumatism.

The question now arises whether or not the use of tobacco and the pipe has any etiologic importance. Bouisson endeavored to show that there was a very near correlation between the use of tobacco and the frequency of epithelioma of the lip and many others have reinforced this opinion, which has given it the name of smoker's cancer. However Velpeau, Malgaigne, Bardeleben, Bruns, Fricke and Loos<sup>7</sup> are against this supposition. Out of Wartmann's<sup>1</sup> 100 cases 51 were smokers, most of them using the pipe. The French authorities are certainly those who accord the greatest etiologic influence from tobacco, and, as a proof of this, they show that since 1830, the date when smoking became general, the frequency of labial epithelioma has rapidly increased. In point of fact the disease which was formerly rare and not noted as relatively predominating over carcinoma of other regions is at present far more frequent.

Tobacco produces buccal leukoplasmia, which certainly predisposes to carcinomatous transformation. Pipe smokers are more exposed than others, because to the irritating influence of tobacco is to be added the traumatism resulting from the pressure and the heat of the pipe. Clay pipes are in this respect far more dangerous than others and it is quite interesting to note that it is in France that the use of the clay pipe is the most common, and, in this country, labial epithelioma appears to be more frequent.

One should always question these patients

if they are in the habit of holding the pipe in their teeth while working, or whether they hold it in the hand, and, whether or not the side on which the lesion is seated is the one which they usually hold the pipe. In this respect Wartmann found the following: of the 51 smokers observed, 27 usually held their pipe on the side of the disease and 10 on the other side. The wearing away of the teeth by the pipe stem is a source of irritation and the lower classes, who by want of hygiene do not neutralize the local effects of the combustion of the tobacco, present epithelioma of the lip much earlier in life than others.

The pipe and tobacco, however, do not explain everything as may be seen by what has already been said, and the female pipe smokers of Brittany and certain parts of Switzerland do not seem to result in the greater frequency of the disease among women. It should also be added that the number of cases of epithelioma of the lip is relatively small when compared to the very great number of smokers. All things taken into consideration it would seem that tobacco has a real influence on the development of malignant disease of the lip, but that it is far less than has been upheld by numerous authorities.

Contagion is merely hypothetical and there are only very few cases which are really striking. Maiweg relates the case of a woman with epithelioma of the lip whose husband had just died from carcinoma of the stomach. Wartmann<sup>1</sup> mentions the following cases: Male, 56 years old, stated that he had drunk from a friend's glass. This friend had some crusts on the lip which were followed by the development of a small tumor. Shortly after this suspicious contact he noticed that he had a small crack on the lip which did not heal in spite of treatment. He then received a blow on the lip which bled freely and shortly after the lip became indurated and the malignant growth appeared. The second case was a man 65 years of age with an epithelioma of the lower lip. He said that the disease occurred after having smoked a cigar butt that he picked up in the street. The third case was a man 78 years of age who had drunk from a friend's glass and he had been affected for about two weeks with a crack of the lip. The fourth case was a man 65 years of age who smoked the pipe of a friend and three or four weeks later a crack in the lip appeared on the left, giving rise to extreme pain and transforming into epithelioma. The fifth and last was a man 53 years old who remarked after having drunk from a dirty glass a small ulceration.

tion of the lip covered with crusts, which formed again after they had been removed. Epithelioma was diagnosed. Wartmann<sup>1</sup> states that he believes these five cases plead in favor of the possible contagiousness of the affection.

A certain prudent reserve should be applied to the interpretation of these cases, because it has been upheld, and I believe rightly so, that carcinoma may become grafted upon a syphilitic lesion which the French authors have described under the term of "hybridites syphilitico-cancerueuse." As Wartmann<sup>1</sup> himself points out, it is quite possible that in the five cases mentioned one was simply dealing with primary manifestations of syphilis which formed an excellent soil upon which the malignant disease became grafted. The first case is interesting inasmuch as the traumatism is quite sufficient to explain the development of the malignant growth and all the patients observe the development of the disease within a time which coincides with the period of inoculation of the chancre. It should, however, be pointed out that no symptom of syphilis appeared afterwards and that nothing in the notes taken justify this hypothesis.

Just as an epithelioma may become grafted on a syphilitic lesion, so it may develop on the limits of a cicatrix of lupus or on itself. Traumatism plays a very important part in the etiology of the disease under consideration and Lowenthal studied 42 cases of epithelioma of the lower lip, 39 being men and three women, in which traumatism was brought out as an etiological factor. Usually these were razor cuts, injuries from pipe stems, kicks from horses, dog bites, wounds from tooth brushes, or during extraction of teeth, burns of the lip and cat scratches, etc. Wartmann<sup>1</sup> found the following traumatisms: A gardener always held his reeds which he used for tying in his mouth while he was working, while in another case the patient stated that he had always eaten his food very hot at noon, because he had little time to take for his meal; while a third incriminated a fly bite as the starting point of his trouble. In many cases the growth appeared only a long time after the traumatism in the cicatrix, while in others the cicatrization was not complete and there still remained an excoriation which transformed malignantly.

The mucosa which lines the inner aspect of the lip is only exceptionally the starting point of malignant disease and in the large majority of cases the affection develops on the cutaneous-mucous border. In 1844 Ecker, and afterward Lebert and Mayor differentiated labial epithelioma from true carcinoma, but at the present

time it is known that there is no essential difference between the two processes.

Microscopically, labial cancrroid is always a lobulated, horny, mucous or even melanotic epithelioma; in other words it is a pavement epithelioma of the free cutaneous-mucous border. It represents the intermediary between cutaneous epithelioma, which ordinarily is quite benign, and that of the tongue, which is far more malignant. Two types are to be distinguished; namely a superficial and a deep one, which is also called dermic. The former arises in the apex of the papillæ and is accompanied by a papillary hypertrophy. The second type arises in the inter-papillary spaces and has a tendency to become diffused in depth. The growth extends in surface in the first place, at least this is usually the case, and then invades the deeper structures. As long as the infiltration does not extend beyond the dermis, the disease progresses slowly and then it continues its progress between the muscular interstices.

The histologic limits of the growth are never distinct and microscopically irregular extension in every direction is seen. The neoplasm next reaches the gum and the maxillary periosteum, the epithelialiments penetrating the interior of the bone by way of the lymphatics following the connective tissue which surrounds the neurovascular sheath and invades the dental canal.

The glands become enlarged early in the disease, which formerly was not recognized or considered only as exceptional, the disease being reputed as a purely local one. In 1846 Lebert considered that infection of the glands was very rare as he only observed it six times out of ninety instances, while in 1903 Wartmann<sup>1</sup> found it 84 times in 100 cases. Duplay and Reclus have stated that involvement of the glands is infrequent before the fifth month, while Loos<sup>7</sup> believes that it may occur anywhere between the third and sixth month after the commencement of the disease, and Janowsky<sup>4</sup> from the second to the third month. Fricke says that the glands may become involved as soon as the growth has reached the size of a walnut. Wartmann<sup>1</sup> in the 84 cases of which he speaks found that in three the glands were involved on both sides, in one six weeks and twice within two months from the commencement of the growth. In his 16 patients who did not present any adenopathy, one had commenced four years previously, one three years and one two years, in the 13 others the tumor had made its appearance about six months previously.

Out of 32 cases operated on from six months to two years after the commencement of the affection, Gussenbauer only found three instances forming perhaps an exception to the rule.

Ordinarily the glands receiving the lymphatics of the region of the first three involved, and Le Dentu and Delbet believe that only exceptionally the glands situated at some distance become invaded. Houel mentions the case in which the entire chain of glands of the neck and those penetrating within the thorax were extensively involved by an epithelial transformation occurring after the development of labial epithelioma.

The lymphatics of the median part of the lip empty into the suprahyoid glands, while those situated on the sides empty into the submaxillary glands. The following details I take from the researches of Dorendorf<sup>6</sup> and Stieda:<sup>3</sup> In the first place the glands seated in the submaxillary fossa should be considered, in the triangular space, limited by the lower jaw and the two bellies of the digastric muscles, these glands are in most instances to be found at three perfectly determined points. The median is in relationship with the facial artery and is situated between the lower border of the lower jaw and the submaxillary gland. The anterior gland, which is the smallest, is to be found on the border of the anterior belly of the digastric, in front of the mylohyoid and beside the submental vessels, consequently it is further away from the jaw than the median gland. The posterior gland is situated at the posterior aspect of the submaxillary gland. There may, however, be a larger number of glands present. The submental glands are equally important; they are represented by all the glands which are to be found between the chin and the os hyoid, between the anterior bellies of the digastrics and will usually be found two or three in number.

The lymphatics of the upper lip not only empty into the glands already mentioned, but also to the superficial cervical glands as well, which number from four to six and are disseminated along the external aspect of the sternocleidomastoid, along the posterior border of this muscle and in the lower part of the subclavicular triangle. They are grouped around the external jugular vein and are covered by the superficial cervical aponeurosis.

The deep cervical glands also receive the lymphatics of the lips. They are far more numerous than the preceding ones. Situated underneath the sternocleidomastoid muscles on the latter aspects of the pharynx and esopha-

gus, they form an uninterrupted chain along the internal jugular vein extending the entire length of the neck. The lymphatic glands of parotid region should also be taken into consideration. The lymphatics of the gums, of the periosteum of the jaw, and those belonging to the regions of the face in the vicinity of the lips also empty into these glands.

The lymph is carried to the glands by the submucous lymphatics and the subcutaneous lymphatics of lesser importance. The former empty into the glands situated on the same side, while the latter become anastomosed so that they empty into glands on both sides. Dorendorf<sup>6</sup> also found that the subcutaneous lymphatics connect the lymphatic territory of the lips with the deep cervical glands and that vessels exist which bring the lips and the gums in relation with the dental canal. In 51 out of 84 cases Wartmann<sup>1</sup> found the glands involved on one side, while in 33 the metastases were bilateral.

As a complication of one or the other of these two categories Wartmann<sup>1</sup> found the submental glands involved 10 times, in six the superficial cervical, once the deep cervicals and once the parotids were involved. The submental adenopathy occurred usually when the growth was seated in the middle of the lip.

Lymphatic involvement may be present, although palpation does not show any enlargement of the glands and oftentimes their degeneration is only discovered during the operation. I have purposely insisted upon the anatomy of the lymphatics, because the only real progress that has been realized latterly in the treatment of carcinoma is the systematic and total extirpation of the lymph nodes which are tributary to the region involved by the growth.

Epithelioma of the lip is nearly always lateral and commences on the mucocutaneous border as an excoriation or a small induration. Out of 100 cases it was seated 27 times on the right, 49 times on the left and 24 in the middle of the lip in Wartmann's<sup>1</sup> cases. This does not coincide with Fricke's results, who adding together those obtained by Koch,<sup>5</sup> Womer, and Maiweg, found out of 563 cases the growth was situated on the right 215 times, in the middle 153 times, while in 195 cases it was seated on the left side. This difference in result may be due to the fact that the latter results were furnished after the growth had fully developed, while Wartmann<sup>1</sup> endeavored to ascertain the site of the affection at its very beginning.

The patients had their attention called to their lips from the presence of a vesicle 19 times,

from an excoriation 15 times, fissure 11 times, a wart 24 times, induration eight times, superficial desquamating plaques three times and once a congenital nevus. In a certain number of cases the commencement could not be exactly defined, because the patients were unable to recall the exact data.

The patient will frequently be quite positive in his assertion that the trouble began by an eruption of some transparent vesicles accompanied by fever and general malaise, which would lead one to believe that he had been afflicted with some mild type of infection. Whether or not an epithelioma may become grafted upon a lesion of such benign character as herpes is an open question, but it should be added that oftentimes when questioned the patient would admit having irritated the primary erosion by scratching it or repeatedly removing the crusts.

The denominations of excoriation or fissure as used by patients often merely express different stages of the disease, because it often happens that the growth begins by a small whitish plaque, which is slightly translucent, formed by a thickening of the epidermis. Little by little the base of the plaque becomes indurated and vascular, the lamella when becoming detached leaves a bloody ulceration underneath it. Now, if this plaque escapes the attention of the patient it will naturally not be mentioned and the commencement of the disease will be attributed to an ulceration or a fissure. These plaques are nothing else than patches of leukoplasmia, which are difficult to make note of in case taking, because the patients are always seen some little time after the commencement of the disease.

There is still another manner in which an epithelioma develops, namely, from a wart, which may vary in size from a millet seed to a small pea; it is grayish in color with an irregular surface and hard in consistency, while it is covered by a thick layer of epidermis. It gives rise to itching and the patient constantly irritates it by scratching.

In whatever way the neoplasm may develop it always ends by ulcerating, which characterizes the height of the process. The ulceration is seated upon an indurated, violet colored base, its borders are raised, hard and clean cut. The surface of the ulceration is irregular, its bottom is covered by a crust of pus and dried blood; brownish in color in that part exposed to the air, while that which is in contact with the saliva will show projections of granulation tissue separated by sulci. This tissue easily bleeds when touched.

The hardness of a labial epithelioma is quite characteristic and frequently if one carefully palpates the lip, a small hard lump will be felt starting from the tumor and extending into the tissues of the lip. For a considerable length of time spontaneous pain is absent or very slight, excepting when the growth comes in contact with solid bodies or irritating substances and only becomes intense when the disease has extended to the lower jaw and the neoplastic masses have penetrated the dental canal. When the process has reached this stage it gives rise to intolerable neuralgia. At this period of the disease the general condition is still fairly good and it is only later that the patient begins to lose flesh, which is quite the reverse from cancer of the tongue, where the patient shows signs of an early cachexia. It is at this time that eating or talking begins to be interfered with and the saliva, being no longer retained within the mouth constantly flows out. The integuments, lips and chin present a violet color and when palpated will be found extremely rigid. The lower jaw is frequently involved at an early date, perhaps not more than three months after the commencement of the disease, but usually this does not take place until from six to nine months. This involvement will occasionally give rise to spontaneous fracture of the jaw.

It is at this period that the general symptoms make their appearance. On account of insufficient feeding the patient begins to get weak and poisoned by the toxins which he absorbs from the ulcerated surface; weakened by repeated hemorrhages, he rapidly loses from day to day. He becomes thin, while his skin takes that characteristic color of cancerous cachexia. Involvement of the viscera is infrequent, but metastases may arise in the stomach, esophagus, etc., not by way of the circulation, but from grafts resulting directly from swallowing cancerous debris. Bergmann has seen a graft take place from one lip to another at the point of contact with an ulcerated epithelioma and this has been observed by a number of others, including myself. It is most infrequent, however, that the disease reaches this condition, because the patient will usually die from some intercurrent disease.

I should also have pointed out that the growth on the lip will increase little by little, but it develops more rapidly the nearer it is to the corner of the lips; it extends in every direction but more especially to the buccal mucosa. It may even involve the tongue.

It is extremely important to make an exact diagnosis at an early date, because the life of

the patient depends upon this fact alone. In point of fact it may be said that the diagnosis of labial epithelioma is not infrequently a difficult matter, especially when the patient is seen at the very beginning of the affection; but I cannot too strongly impress upon the general practitioner that a patch of leukoplasia, a small crack, or a tiny wart seated upon the lip should always be held as suspicious, especially when the patient is past middle life, and a good rule to go by is that any pathologic manifestation occurring on the lips, tongue, or nose will in all probability develop into, if they are not already, malignant processes.

In those cases where a differential diagnosis does not lighten the situation it is perhaps better to carry out the expectant plan but never make matters worse by resorting to the use of nitrate of silver or other caustics, because all these substances will merely aggravate the progress of the affection and cause the loss of much valuable time.

The induration is a most important sign which should always be looked for with care; it is not pathognomonic, but as soon as it exists it limits the diagnosis. When the growth has developed the diagnosis is easier; the tumor rises above the surface of the lip, its borders are hard; its surface ulcerated, the glands become involved, while the patient is in middle life.

The differential diagnosis is to be made with the following diseases: Simple cracks and erosions may simulate an epithelioma at its beginning, but their seat is not usually that of a malignant growth. They are usually found in the middle of the lip, they readily yield to treatment and the subjects having them are young. Fibromas and lipomas are rarely encountered in the lips, but when they do occur they do not become ulcerated and present certain special characters which render their diagnosis an easy matter. Adenoma of the labial glands may be a cause of error; the lip swells on its mucous aspect as the tumor develops, its surface becomes ulcerated and if the borders of the ulcer become hard it may simulate a malignant growth very closely, but the anamnesis, the site of the growth, its indolence up to the time that ulceration commences will aid the diagnosis. Involvement of the glands never takes place even when the growth has been present for a long time.

Erectile growths when they become ulcerated, offer certain diagnostic difficulties. The capillaries of the periphery are dilated, the tumor bleeds very easily, but the general condition remains perfect. Sarcoma, which is very

infrequently met as a primary growth of the lip, has a softer consistency and a slower development than epithelioma. Lupus more frequently develops on the upper lip; it is ser-piginous, presents parts which have become cicatrized, while nuclei, as yet not ulcerated, are scattered around. Tuberculous ulcerations are very painful from the start and are met in subjects presenting other manifestations of this disease. They are rarely limited to the lip, and usually the internal aspect of the cheeks, the tongue and pharynx are also involved. They are seen in the form of yellowish points with irregular borders; the ulceration is not deep, not extending beyond the submucous cellular tissue. The bottom of the ulcer is grayish in color and if scraped reveals an unequal and granular surface. At the periphery, the mucosa is purple in color, from which a certain number of small yellowish points are made evident, although they are sometimes absent. The lymphatic glands suppurate at an early date.

Mercurial ulcerations give rise to fetid breath, sialorrhea, swelling of the tongue and loosening of the teeth; they are seated on the posterior aspect of the lips. The differential diagnosis with syphilis gives rise to the greatest difficulty; at the tertiary period the diagnosis is not very difficult. The syphiloma when diffuse is characteristic and there is a disproportion between the induration and the size of the ulceration. Gummas are more likely to occur on the upper lip and respect the free border. They develop insidiously in the form of small tumors which open outwardly, leaving a deep ulceration which rapidly invades the neighboring tissues. The ulcer is surrounded by a characteristic red areole, its borders are inflamed and uneven. If the base of the gumma is pressed upon, it will be found hard, but the tumor upon which the ulceration lies cannot be limited as in the case of cancrroid. The glands are never greatly enlarged. Mucous patches have regular borders, they are rounded, not indurated and the mucosa projects rather than being depressed; in reality it is a superficial lesion. A chancre of the lip may take on absolutely the same characters as an epithelioma; the induration, however, may be wanting sometimes, or at any rate is only slightly marked, but when it is present it is quite as resistant as cartilage. Then again it follows the ulceration instead of preceding it. The ulceration is superficial, dry and occasionally presents a varnished aspect; its base projects more than its borders. A chancre will rarely exceed a centimeter in diameter, but it may become larger when complicated with

phagedenism. When exposed to air, or to the contact of liquids, it becomes edematous, and, under these circumstances, it may simulate a cancrroid. Enlargement of the glands is marked and occurs early. A chancre may develop most anywhere on the lips, but it is more frequently met with in young subjects, especially women. Its development will soon do away with all doubt, but on account of its great similarity to malignant tumors of the lip, one should always be on one's guard in order to avoid any error.

If an early operation is not undertaken the prognosis of epithelioma of the lips becomes most serious, because death will inevitably result, usually within three years from the onset. On the other hand, if an operation is done early in the progress of the disease the prognosis is better as is shown by statistics in general and some of my personal cases. One should, however, not become too optimistic on account of certain opinions which have been emitted upholding that involvement of the lymphatics takes place late in the progress of the disease and that the growth never returns after extirpation. This is quite a different opinion from that upheld by Billroth, who thought malignant disease of the lips always recurred. Loos,<sup>7</sup> basing himself on the material obtained at von Bruns' clinic, says that extensive resections of the lower jaw are absolutely unfavorable as far as the prognosis is concerned. Extensive and repeated operations do not give durable results. Cancroid of the lower lip recurred in 33 percent of their cases, while local recurrences have amounted to 18 percent since 1885 but since this time they have dropped to as low as 6 percent. Out of 100 recurrences, the lip alone was the seat in 35 cases, the glands alone in 41 and both lip and glands in 22. The recurrence occurred usually within the first six months, 10 percent only after a lapse of time of more than three years. Among the first recurrences 11.7 percent of the cases who were again operated upon were successful, while relative to the second recurrences, 1.1 percent only were favorable. However, even in these cases the life of the patient was prolonged. Statistics do not, however, as yet give us sufficiently sure notions in order to judge the question of systematic extirpation of the glands. At any rate the histologic and positive evidence of infection of the glands is always to be considered as unfavorable from the standpoint of the prognosis. From 1843 to 1885 the operative mortality was 6.2 percent and from 1885 to 1898 it was 0.4 percent. The ulti-

mate result of the operation was favorable in 77.2 percent and unfavorable in 22.8 percent.

We now come to Janowski's<sup>4</sup> opinion. Operations for malignant disease of the lower lip have little danger and the conditions of cicatrization are so favorable that union by first intention is usually obtained from between nine and fifteen days. He does not consider resection of the lower jaw as bad as does Loos<sup>7</sup> and he admits that this interference, combined with extirpation of the glands may result in a radical cure. In the cases that he publishes and in which the glands could not be palpated, recurrences occurred quite as frequently after operation as in other cases. He obtained good results in 49 percent of his patients; the recurrences usually took place during the first six months following operations and those occurring from one to two years afterward were quite the exception. These usually took place in the neighborhood of the cicatrix, or in the submental region. The duration of the disease has less influence upon the operative result than the malignancy of the process. The favorable types, with a slow development, were frequently operated on successfully even after two or three years had elapsed since the commencement of the process. An advanced age is not an operative contraindication and the best results were obtained in subjects from 60 to 70 years of age. In cases in which a recurrence has taken place several times it is quite possible to prolong the patient's life by an operation, but only for a short time. Relative to the duration of the disease the rapidly developing malignant type amounted to 25 percent of the cases, while 15 percent were relatively favorable and the remainder belonged to the transitional forms.

Fricke says that the propagation of the growth to the lower jaw excludes almost completely the possibility of a radical cure, while a lymphatic involvement is distinctly unfavorable and the same may be said of extensive growths. A patient with a recurrence has quite as much chance to have a second one, as to get well. In his statistics 6.5 percent of the patients died from the operation, and 32.5 percent of recurrences, and 67.5 percent were discharged well.

The French authors admit that 87.6 percent of recurrences occur during the first year and that, although the prognosis is better than for other forms of cancer an unsuccessful outcome is almost certain when the tumor is diffused and the glands adherent.

Wartmann<sup>1</sup> studied 27 cases who were still alive 18 months or more after the operation and found that 16 of them were successful and

four probably so. Consequently he finds 59.25 percent good results. These figures show a means between those already given by Loos<sup>7</sup> 77.2 percent, Janowsky<sup>4</sup> 49 percent, Fricke 67.5 percent. According to this percentage patients have hardly any more chance to get well than to have recurrences and Fricke's proposition does not only apply to the first recurrences, but to the primary operation as well.

I would point out that the involvement of the lower jaw is not an operative contraindication, although it renders the prognosis worse. One cannot affirm that a radical cure will be more likely obtained when resection of the jaw is done than when simple extirpation of the growth is undertaken. The fact that the lymphatic glands are infected has less affect than one might be led to believe, because out of 20 favorable cases reported by Wartmann<sup>1</sup> enlarged glands were removed in 11 of them. From what has been said, it at once becomes evident that epithelioma of the lip is a very serious affair, whose malignancy can be reduced to about 50 percent if a free and early operation is done and for this reason the prognosis should always be reserved.

The treatment naturally is indicated by what has been already said. A very free and early operation, consisting in the removal of the neoplasm, the lymphatic glands and the bone itself, if necessary. It is far better practice to remove those glands that may appear healthy than to leave one that is diseased. As to the technic it will vary according to the choice of each operator.

It should be pointed out that one will meet with cases where no operation will be of any avail and a prudent surgeon will always feel his way with care before interfering in patients whose general condition is already compromised. The resources of medicine are then the only ones to look to. The buccal cavity should be frequently disinfected and arsenic given internally may have some little action on some of these growths. Cauterization will sometimes be useful in cases when there is much hemorrhage or when the development of the tumor becomes exuberant.

#### LITERATURE.

<sup>1</sup> Wartmann: Thèse., Geneva, 1903.

<sup>2</sup> Dugué: Thèse., Paris, 1901.

<sup>3</sup> Stieda: Langenbach's Archiv., Band 63, 1902.

<sup>4</sup> Janowsky: *Idem*, Band 65, 1902.

<sup>5</sup> Koch: Deutsche Zeitschrift für Chirurgie, Band 15.

<sup>6</sup> Dorendorf: Internat. Monatsschrift für Anatomie und Physiologie, Band 17, 1900.

<sup>7</sup> Loos: Beiträge zur Klinische Chirurgie, Band 27, 1900.

## RECENT EDITORIAL OPINIONS.

**Journal of the American Medical Association.**—**HORMONES:** This term, meaning to arouse or stimulate, is frequently making its appearance in current physiologic literature. It is a general name for substances formed in one tissue or organ for the purpose of stimulating another tissue or organ to which they are carried by the blood stream. Examples are secretion of the intestine, "pancreas activator," thyroiodin, and adrenalin. The internal secretions of the ovary and testicle are presumably of this nature although not all internal secretions are hormones.—**THE LABORATORY IN DIAGNOSIS:** The effect on the medical student by instruction as now given is to engender a false idea of the value of laboratory work. The average physician has too exalted an idea of the science of medicine and too pessimistic a view of the art. Too many sit back in their chairs waiting for the laboratory to make a diagnosis when often the problem could be solved by the use of their own eyes, ears and fingers. Laboratory workers have made great advances but too many errors are made when the physician relies on reports of a pathologist who lacks clinical experience and whose opinion is based on abstract specimens from a patient regarding whom he knows nothing.—**THE FOURTH DISEASE (FILATOW—DUKES' DISEASE)?** The mild form of scarlet fever now occurring in Chicago and other places has raised the question whether the cases are those of the "fourth disease." Opinion is divided as to the existence of such an entity. Probably the opinion of the best observers may be thus summarized: The epidemics classed under the designation "fourth disease" comprise either cases of rötheln or mild scarlatina or some cases of rötheln and some of scarlatina.—**HEALTH AND HIGHER EDUCATION:** The strain of college and university life seems often to have been detrimental to the health of women: In New York, statistics show three times as many mentally diseased women as men in the well-educated classes. The question of the effect of education, however, is too serious to be decide offhand. Accompanying dissipation must also be considered. Physicians should interest themselves in this question as they are in a position to collect data of great value in solving the problem.—**SCARLET FEVER AND MILK:** Sanitary authorities are unanimous in attributing certain outbreaks of scarlet fever to milk infection. The objection that the mode of spread is conjectural because the exact cause

is unknown is not tenable. Hence although it appears clear that scarlet fever less often than typhoid is spread by milk the danger doubtless exists and should be guarded against.—**EXPERIMENTAL SYPHILIS:** Experimental work on apes has led to a revival of the work on rabbits, both giving evidence that the disease is more or less transmissible to the lower animals. Infectiousness of tertiary lesions has been proved.—**HOSPITAL AND DISPENSARY ABUSE:** The flooding of hospitals and dispensaries with pseudo-charity patients can be explained in two ways only. First, the tendency of human nature to obtain something for nothing, and, second, lack of business administration by institutions thus imposed upon. The abuse from the standpoint of the profession is a serious one and from a humanitarian view should be remedied because worthy poor are deprived from using these institutions.—**TREATMENT OF DIABETES WITH EXTRACTS OF MUCOSA OF THE DUODENUM:** The discovery of secretin opens up a new field of investigation regarding diabetes, a new therapy for certain cases being suggested. The secretin hypothesis throws no light on the importance of the islands of Langerhans, as that substance may stimulate both parenchyma and island cells alike. The observations thus far made are only preliminary gropings which must be elaborated before systems of treatment or hypotheses as to the etiology of diabetes can be soundly established.—**SENSATIONALISM AND CRIMINAL SUGGESTION:** There is much difference of opinion as to the advisability of printing details of criminal trials. What is appreciated only by physicians is the power of suggestion to familiarize minds of minor resisting power with evil and the possible later commission of it. This power of suggestion is likely to be stronger with regard to crimes other than murder and suicide. The weight of the influence of physicians should be used to save people from evils that are quite as sure to do them harm as would contact with contagious disease or insanitary surroundings.—**TO ABOLISH SMALLPOX QUARANTINE:** The Minnesota State Board of Health resolution to abolish smallpox quarantine appears to be an extreme measure. Consideration, however, shows that quarantine ought not to be necessary. The abolition of quarantine would put the public more on guard and lay the responsibility on the antivaccinationists who at present are unduly active. If the public felt that vaccination was the only real protection it might come to demand general vaccination. The Minnesota board sees no use in requiring quarantine if vaccination cannot be generally enforced

and there is much justice in this view. The effect of their action will be interesting to observe.—**PSYCHIATRIC CLINICS IN HOSPITALS FOR THE INSANE:** Resolutions condemning such clinics have been introduced in the Illinois Legislature by the speaker of the House. The ostensible ground of objection is the supposed ignominy and hardship of the inmates thus used. Such institutions are designed not only for the benefit of inmates but to prevent and cure the growing evil of mental disorder in the State and the idea of their function as embodied in the resolution seems a narrow one. Such clinics have proved their value abroad and their more general adoption in this country would be a signal service to humanity.—**THE SIGNIFICANCE OF DECREASED HYDROCHLORIC ACID IN GASTRIC CANCER:** Two recent papers bring out the fact that the decreased acidity of gastric cancer does not depend on the cancer in the stomach, as it occurs when a malignant growth is situated anywhere in the body. It appears that cancer of the stomach exercises no specific influence on the secretion of hydrochloric acid. A suggested explanation of the general effect of cancer is that the blood contains fewer free hydrogen ions to be secreted by the gastric cells as free acid. However this may be, the new observation must have an important bearing on clinical diagnosis by means of the gastric juice.—**GORGAS A MEMBER OF THE ISTHMIAN CANAL COMMISSION:** This appointment is of more than ordinary importance to the country and to the medical profession. The American Medical Association strongly urged it in 1904. The final appointment of Colonel Gorgas is a recognition of the principle that the medical profession in public station should by right be placed in executive control of its own science. In its personal aspects the appointment is a just appreciation of the services of Colonel Gorgas.—**THE URINE IN CONTRACTED KIDNEY:** Recent investigations show that some of the signs generally regarded as being constant in this condition are far from being so. Nagel finds that polyuria occurs in only one-third the cases, increased blood-pressure in less than three-fourths, and appreciable heart hypertrophy in a little over four-fifths. This emphasizes the necessity of correlating clinical and laboratory findings before making a diagnosis and also of avoiding too strict adherence to textbook descriptions of disease.—**COEDUCATION:** There is now in America a tendency to question the benefits of coeducation. At the same time Great Britain is adopting it with some enthusiasm. The result is this country, as far as

women are concerned, will compare favorably with that in other countries and the American man shows no signs of effeminacy resulting therefrom. The whole question requires further consideration from a medical standpoint. During adolescence, coeducation might perhaps well be abandoned.

**Boston Medical and Surgical Journal.**—

**THE RECOGNITION OF TUBERCULOSIS AS AN INDUSTRIAL FACTOR:** In America the management of the tuberculous has generally been actuated by philanthropic rather than economic motives. Recently in Providence and Brockton there has been made a move by the business men to reach the tuberculous factory operatives. This organization is an important advance. On an economic basis an appeal can be made to every employer.—**A CARCINOMA PARASITE:** A statement of special interest as coming from an acknowledged authority in biologic research is that of Professor Calkins regarding a probable parasite accompanying carcinoma in mice. Levaditi's staining method has revealed a spirocheta in every strain of transplanted tumors in the Buffalo laboratory. There appears to be no question as to the organic nature of the parasite in question. If ultimately found in all cancers the conclusion will be that this organism is the cause of the disease.—**RELATION OF MEDICINE TO DENTISTRY:** The question as to the theoretic and practical relationship of these two professions is a perennial one. From the broad point of view dentistry must be regarded as a special branch of medicine, a branch so far specialized, however, that the medical practitioner ignores it in his own training. At the present time it is desirable that dentistry should be considered by physicians as an integral part of medicine. The removal of the dental department from a university is a loss not only to the department of dentistry but also to the department of medicine.—**POPULAR MEDICAL LECTURES:** The experiment of the Harvard Medical School in giving popular lectures has thus far met with success, the attendance being large. As to whether the people have carried away misconceptions of the subjects is a pertinent question. The aim of the lecturers should be to state the facts exactly as they are. The public should be warned against the dangers of disease but the possibilities should not be exaggerated to the extent of creating unhealthy alarm.—**ILLUSTRATIONS THAT DO NOT ILLUMINE:** Very frequently medical weeklies contain photographic illustrations that are not clear and in no way aid the reader in understanding the views of the author.

Such illustrations detract from the appearance of the journal and their cost is a waste of money. Primarily poor illustrations are due to the facts that subjects are chosen and photographs made without regard to the method of reproduction. Medical journals should decline to stand the expense of illustrations whenever the editor believes the illustration will fail to show what it is intended to show.—**INSANITY AND THE LAW COURTS:** Sophistry has long been the bane of the medical doctor. In medical discussions or in medical journals it is not particularly harmful but when the main stock in trade of the medical expert it is harmful in two ways; it defeats the ends of justice and casts undeserved discredit upon the profession in general and the expert in particular. "So long as the laws relating to expert testimony remain as they are, and so long as trials for capital crimes continue to be conducted as at present, the medical profession may make up its mind that the theories concerning insanity which today pass muster in the courts will continue to be a barrier to the advancement of mental science and an obstacle to the proper appreciation of the untiring efforts of well-balanced and devoted men."—**ACUTE CARDIAC DILATION:** Deaths from this condition, during or after acute infectious diseases, are being reported with disconcerting frequency. It is by no means amiss to counsel that the period of rest after these diseases should be prolonged. Dilation of the heart should specially be guarded against when temperature changes have been marked and prolonged.

**New York Medical Journal.**—**MILK AND TUBERCULOUS DISEASE:** Koch's opinion regarding the difference between human and bovine tuberculosis is now almost discredited. The present doctrine is that infection takes place much oftener by the digestive tract than by the air passages; we naturally regard milk as the source of infection. Pasteurization cannot be relied upon as a protector unless the producer does the pasteurizing. The tuberculin test should more frequently be applied to cows. Certainly in one way or another our milk supply should be placed above suspicion.—**THE PRELIMINARY COMMUNICATION:** Much fruitless wrangling about credit for priority might be avoided by an early announcement, not meaning, of course, that a man should rush into print on the first conception of an idea. The author's own interest would not alone be promoted, for others would take up the idea and prove the value or fallaciousness of it in a relatively short time. Either of these should be welcomed by any sincere worker.—**THE TERM OF THE NURSE'S**

**INSTRUCTION:** The graduate nurses in New York have endorsed an application to the hospital governing boards to retain the present three years' course of nursing instead of returning to the two years' course as projected. Their arguments are well founded but it must be remembered that the return to the shorter time would not reduce their course to less than is now accorded as a maximum to the medical officers of the house staff. The idea in both cases is presumably to provide a moderately efficient course for a large number instead of perfecting a few.—**HEMATURIA IN CHILDREN:** Purely congestive hematuria may be met in children and the prognosis is usually excellent. Cupping of the renal region and calcium chlorid, 15 grains daily, with a milk diet is usually sufficient rapidly to cause this symptom to disappear. Hematuria may also mean a nephritis, distinguished by the persistence of albuminuria after the blood has disappeared from the urine.—**CRANIOTOMY AND THE CESAREAN OPERATION:** Franz, a country practitioner, reports two successful instances of cesarean operation and rightly says it is not always necessary to take the patient to a hospital for this procedure. Every general practitioner should be prepared to do this operation when it is not possible to secure a professed surgeon. There appears no good reason why a physician wise in the use of medical and hygienic measures should not be held capable of performing major surgical operations. The layman's dissent from this view ought to be susceptible of being overcome.—**THE MIDWIVES OF NEW YORK:** Recent investigation has shown that in the boro of Manhattan alone are between 900 and 1,000 practising midwives. They have no legal status under the State laws and many are illiterate and the practice has degraded into carelessness and criminality in many instances. Only one-tenth have equipments kept even ordinarily clean. In Europe midwives are accepted as inevitable, given proper instruction and licensed. England was the last to overcome the prejudice which appears the cause of our own inertia in the matter, and in 1902 made operative a midwives' act which has been of service. Here the problem is a pressing one.

**Medical Record.**—**A PROPOSED ORGANIZATION OF ARMY SURGEONS:** It appears necessary for the army surgeons to organize for their own advancement as Congress does not appear disposed to heed individual requests for increasing the efficiency of the medical department. The public really looks to the surgeons themselves to do this work. Instead there is profound

silence from most of the officers.—**AN IMPORTANT DECISION REGARDING THE PRACTICE OF MEDICINE:** An opinion embodying a legal definition of the practice of medicine by Justice Clarke, of the Supreme Court of New York, will do much to help in the warfare against irregular practice and quackery. The court in confirming the conviction of a mechano-neural therapist who contended he was not practising medicine said: "To confine the definition of the words 'practise medicine' to the mere administration of drugs or the use of surgical instruments would be to eliminate the very cornerstone of successful medical practice, namely, the diagnosis. It would rule out of the profession those great physicians whose work is confined to consultation—the diagnosticians, who leave to others the details of practice. "When we find," he concluded, "as in this case, a defendant holding himself out by sign and card as a doctor, with office hours, who talks of his patients and gives treatments, who makes a diagnosis and prescribes diet and conduct and remedies, simple though they be, and who asserts the power to cure all diseases that any physician can cure without drugs, and also diseases that they cannot cure with drugs, and who takes payment for a consultation wherein there was an examination and determination of the trouble—that is, a diagnosis—as well as payment for subsequent treatment, even if no drugs are administered, we must hold that he comes within the purview of the State prohibiting the practice of medicine without being lawfully authorized and registered."—**THE INCOME OF PRACTISING PHYSICIANS:** For some time the earnings of physicians in Great Britain have been progressively decreasing. Hospitals, medical clubs and prescribing by druggists are assigned as causes. Competition is more severe in this country but on the whole fees are higher. Two causes of lowered income must not be overlooked: Decreased morbidity and improved methods of treatment.—**A SUBSTITUTE FOR THE CATGUT LIGATURE:** Catgut by no means fulfils all the requirements of a satisfactory ligature, yet it has for many years held the field against all comers. Senn has secured good results from the use of tendons from some of the larger Arctic mammalia, as the whale, walrus and seal. These are not so difficult to secure as appears at first sight and if made commercially available may be found an efficient substitute for catgut.

**Gaillard's Southern Medicine.**—**THE CHARACTER OF THE PAPER TO BE READ BEFORE A MEDICAL SOCIETY:** Ideas rather than words

should be quoted. Doctors tire of hearing old axioms. It would be presuming for a reader to assume that none of his hearers know the source of quotations. The paper must be an epitome, even if presenting something new, for the object is to provoke discussion. The shibboleth of the reader should be brevity; this gives time for discussion and the possible bringing out of points of which the reader never heard.

**St. Louis Medical Review.**—THE DIVORCE OF SURGERY FROM MEDICINE: Surgical literature has devoted practically no space to Grocco's sign, announced five years ago, this being one more thing emphasizing the comparative disinterestedness of surgeons toward the science of diagnosis. The modern surgeon tends to lose himself in a veritable maze of technic. A microscopically modified incision for appendicitis will be accorded pages of comment. There is no reason why surgery should display the slightest apathy regarding physical diagnosis. The surgeon should be as well equipped to interpret physical signs as is the internist.

## NEWS AND NOTES.

**Bubonic Plague at Brisbane, Australia.**—Sixteen cases of the bubonic plague have appeared in a new form, and seven of them have resulted fatally.

**State to Guard Food.**—A pure food bill, which contemplates cooperation between the State and the federal government in the prosecution of violations, and which in most of its details follows out the provisions of the federal statute on the subject has been introduced in the New York Assembly by Assemblyman Reece, who also introduced the pasteurized milk bill. The bill takes from health officers most of their duties relative to detection of violations of the health law so far as it relates to food-stuffs, and transfers them to the State Commissioner of Agriculture.

**Army Medical Corps Examinations.**—Preliminary examinations for appointment of assistant surgeons in the army will be held on April 29 and July 29, 1907, at points to be designated hereafter. Permission to appear for examination can be obtained upon application to the Surgeon-General, U. S. Army, Washington, D. C., from whom full information concerning the examination can be procured. The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between 22 and 30 years of age, a graduate of a medical school legally

authorized to confer the degree of doctor of medicine, shall be of good moral character and habits, and shall have had at least one year's hospital training or its equivalent in practice. The examinations will be held concurrently throughout the country, at points where boards can be convened. Due consideration will be given to the localities from which applications are received in order to lessen the traveling expenses of applicants as much as possible. In order to perfect all necessary arrangements for the examinations of April 29, applications must be complete and in possession of the Surgeon-General on or before April 1. Early attention is therefore enjoined upon all intending applicants. There are at present 25 vacancies in the medical corps of the army.

**Pennsylvania Raises the Requirements for Admission to Medical School.**—Recognizing the advantages of a broader general education and the growing necessity of the prospective student having in addition special preparation for the study of medicine, the Board of Trustees of the University of Pennsylvania has decided recently to raise the requirements for admission to its medical school. These requirements include two years of general college training and in addition a certain knowledge of biology, chemistry and physics. According to the plan which has been adopted, the standard will be raised gradually, beginning with the academic year 1908-1909 and reaching the maximum 1910-1911.

**A severe epidemic of smallpox**, with a high mortality, is now prevailing at Marseilles, France. One hundred deaths have occurred in one day.

**An illustrated cyclopedia of American medical biography**, to be issued in several volumes, is being prepared by Dr. Howard A. Kelly, professor of gynecology in the Johns Hopkins University. The work will include sketches of the careers of all the medical worthies of the United States and Canada from the earliest times to our own day.

**An invalid home for physicians** and a medical library are proposed in honor of the twenty-fifth anniversary of the death of the Russian surgeon, Porogoff.

**The New York College of Physicians and Surgeons** will be 100 years old in June, and it has been voted by the faculty to have an elaborate centennial celebration. Although plans are now only in the making, it has already been decided to have an alumni dinner to which it is expected a large number of those who have graduated from the college since the alumni

association was founded, nearly 50 years ago, will come from all parts of the United States. Various academic exercises will also be on the program. The college existed as an independent institution until 1890, when it became a part of Columbia. The first class was graduated in 1811.

**The total mortality** of the municipal district of Havana in January last was 553, equivalent to the annual rate of 23.25 per 1000 inhabitants. Only one case of yellow fever has occurred in Cuba since January 1. The patient was a Spaniard.

**Danger of the Tuberculosis House.**—It has been determined in Paris that in certain houses the tuberculosis mortality is double that of others.

**Drug Interests Fight Anticocain Bill.**—Representatives of drug interests and patent preparations containing cocain appeared before the New York Assembly Codes Committee in opposition to the A. E. Smith bill which prevents the general and indiscriminate sale of cocain. Under the bill it could be sold only on the prescription of a physician.

**The Osiris bequest** of \$5,000,000 to the Pasteur Institute of Paris was made to assure to the institute a revenue of \$200,000 to enable it to investigate the diseases that afflict mankind and discover remedies for them.

**Medical Licensing in Canada.**—The Dominion of Canada possesses no general register with a recognized standard of qualification for the medical profession. Each province possesses the right to establish its own licensing authority, and medical men qualified and registered in one province are not allowed to practise in an adjoining province under penalty of a fine.

**Suicide in Vienna.**—In the year which has just ended 425 persons—313 men and 112 women—committed suicide, while 707 men and women attempted unsuccessfully to do so. The victims were of all ages, ranging from an old man of 87 to a little girl of eight years. Sickness was the motive alleged in 100 cases, unhappy love affairs in 63, family strife 24, satiety of life 33, and poverty 31. Twelve women and 118 men shot themselves, 19 men and 32 women took poison, while 10 men and 28 women threw themselves from top story windows, a form of suicide common in Vienna.

**Personal Equation in Blood-corpuscles.**—A lay journal states that Professor Theobald Smith, of Boston, is working on researches into the personal equation in blood-corpuscles. The statement is made that European scientists are already convinced, from the work done, that the

time may come when it will be possible for science not merely to identify blood, as blood, or as human blood, but to say positively whether it came from this or that family.

**A special "snake-bite lancet"** invented by Sir Lauder Brunton, is being distributed in India. With the aid of such a lancet, one man saved in a year the lives of 20 persons bitten by cobras and karaites.

**Bequest to Oxford Medical Professorship.**—It is announced that the late Dr. Gustave Schorstein bequeathed \$2,500 to the regius professor of medicine at the University of Oxford for the pathologic department of the medical school to the London hospital, and a sum, which will amount to some \$50,000, in trust to the University of Oxford, subject to certain life interests.

**State-aided Insurance.**—A letter in the London *Spectator* furnishes some very interesting information concerning the results of State-aided insurance in Germany. It appears that about one German in five is insured for sickness, one in three for accident, and one in four for infirmity or old age. Every year nearly \$125,000,000 is paid to sick, injured, infirm, or old persons. Of this amount \$62,500,000 is found by employers, \$51,250,000 by insured persons, and \$12,225,000 by the State. Every insured working woman who is confined receives an allowance for six weeks. The system of insurance for infirmity has had very remarkable results. It is, of course, much better for a person disabled by some cause other than old age, as well as for the community, that he or she should be enabled to resume work; and as the law permits the insurance associations either to treat infirm persons in sanatoriums or to give them pensions, a large number of sanatoriums have been erected all over the land. A very large proportion of sufferers who apply for allowances have tuberculosis. Among men aged from 20 to 24 who are incapacitated, about 55 percent suffer from it. No less than 74 open-air sanatoriums have been built for the treatment of these patients. On an average each victim remains under treatment about three months. In 1902 16,518 persons suffering from tuberculosis, and 19,433 suffering from other diseases, were treated under the insurance law. The proportion of tuberculosis patients who regain power to work for a living is more than 75 percent but a good many relapse when they return to their crowded dwellings and to hard work. Yet at the end of four years after treatment 31 percent of the patients were able to work.

**Prizes in Ophthalmology.**—The late Professor Herman Cohn, of Breslau, well known as an ophthalmologist, bequeathed the sum of 10,000 marks to each of the universities of Heidelberg, Tübingen, and Breslau, the income to be used for prizes for research in ophthalmology.—The Treasurer of Guy's Hospital has received a bequest of \$5,000 under the will of the late Dr. Charles James Oldham, F. R. C. S., Surgeon to the Sussex and Brighton Hospital for Diseases of the Eye, for the purpose of endowing 'an annual prize in ophthalmology at the medical school. A further anonymous donation of \$1,000 has been received for the fund of the Endowment of Medical Education and Research.

**Pharmacopeial Changes.**—The committee of revision has sent out a circular setting forth the following changes:

FORMERLY.	Now.
Alkaloids, percent.	Alkaloids, percent.
0.35 Belladonna leaf.....	0.3
0.5 Belladonna root.....	0.45
0.55 Colchicum seed.....	0.45
2 Ipecac.....	1.75
Resin, percent.	Resin, percent.
8 Jalap root.....	7
Alkaloids, percent.	Alkaloids, percent.
0.35 Stramonium leaf.....	0.25
1.4 Extract of stramonium.....	1
Gm. in 100 cc.	Gm. in 100 cc.
0.35 Fluid extract of stramonium..	0.25
0.03 Tincture of stramonium.....	0.025
0.5 Fluid extract of belladonna root	0.4
0.35 Tincture of belladonna leaf...	0.03
0.5 Fluid extract of colchicum seed	0.4
0.05 Tincture of colchicum seed....	0.04
1.75 Fluid extract of ipecac.....	1.5

The acid test in the last paragraph on petrolatum has been dropped. Kerner's test for quinin sulfate is modified so as to meet the requirements of the Pharmacopeia of 1890.

**Cheap Surgical Dressing.**—Military journals say that at a cost of 24 cents Japanese doctors can dress the wounds of 500 men. They use a finely powdered charcoal obtained by the slow combustion of straw in closed furnaces. Sachets filled with it are applied to the wounds, and its antiseptic and absorbent qualities generally effect a rapid cure.

**Packers to Guarantee Foods Pure.**—The Tri-State Packers' Association, at its annual meeting at Wilmington, Del., decided to adopt a guarantee that all goods packed by members of the association shall conform to the standard

of the pure food law. It also favors pure food laws in New Jersey, Delaware and Maryland, the three States represented in the association.

**Appendicitis** has made such steady progress in Germany from year to year that medical societies have taken it up for special extended study.

**Against Vivisection.**—A bill has been introduced into the Pennsylvania Legislature making it unlawful to vivisect or experiment on any living animal for any purpose, scientific or otherwise, and fixing as a penalty a fine of from \$100 to \$500, or imprisonment for from 30 to 60 days, or both.

**To Reduce Infant Mortality.**—The city of Munich has voted a grant of \$25,000 to be applied toward the diminution of infant mortality.

**A Scientist's Brain.**—Professor Bechterew, of St. Petersburg, has examined the brain of the late Professor Mendeléeff. It is said to weigh more than 1,200 grams, and to be remarkable for the number of its convolutions.

**To Assist Students Abroad.**—A bureau of medical information has been established in the Kaiserin Friedrich Haus, Lutsenplatz, Berlin, where foreign doctors visiting that city can obtain without charge all particulars as to courses of instruction, meetings of societies, admission to hospital clinics, and to polyclinics and other matters of professional interest.

**Number of Women Physicians.**—It is estimated that there are 25,000 women in America who possess medical diplomas.

**University Medical Students.**—*Science*, December 21, 1906, gives a list of 23 of the leading United States universities, stating that there are matriculated 4,903 students in the medical faculties. The University of Pennsylvania has 594 students, while the University of California has the smallest number, 54. New York has 448; Columbia, 352; Syracuse, 150; Cornell, 336. The others are given as follows: Northwestern University, 500; Illinois, 488; Michigan, 423; Harvard, 296; Johns Hopkins, 264; Minnesota, 196; Yale, 155; Virginia, 133; Nebraska, 132; Kansas, 107; Indiana, 65; Missouri, 65.

**The largest crematory** in Germany is at Gotha. The number of bodies burned in it last year was 445, an increase of 56 over 1905.

**Efforts to exterminate the plague** in New South Wales led to the killing last year of over 91,600 mice and rats. Plague germs were found in 123 rats and 18 mice.

# American Medicine

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G. C. C. HOWARD, *Managing Editor.* 195

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**The extensive use of quinin at Panama**—close upon four grains daily per capita—is mentioned in the sanitary reports, and it is a matter of more than ordinary scientific importance. The old habit of prescribing it for everything, from coryza to typhoid, has happily ended, for it was worse than a waste of good medicine. In malarial localities, its use by the sick has long been forbidden, unless the plasmodium is demonstrated. Otherwise the diagnosis is rendered difficult. As a prophylactic for the healthy, opinions differ as to its value in safe doses, for there is a suspicion that its prolonged use is poisonous if the doses are large enough to be effective. It seems then that if there is no danger of malaria in the zone, the drug is unnecessary and may be doing harm. If it is used either as a preventive or cure, malaria is alarmingly prevalent.

**The mosquito crusade** has eliminated the danger of yellow fever and has proved an indispensable part of tropical life, for otherwise prolonged residence is not possible for nonimmune races. It is generally believed that there was an equal success as to malaria at Panama, and returning visitors all seem to get that impression. If it is not a fact, the truth should be widely known, so that there may not be a false sense of security which may be the undoing of many an employe. There is no doubt that the mosquito warfare has banished malaria from many places and enormously reduced

it in others, but it also seems that there are localities so surrounded by innumerable breeding places, that it cannot be eliminated. We should not expect too much. A failure to "make good" creates unjust criticism.

**Malaria at Panama** does seem in the long run to be more dangerous than the dreaded yellow fever. Excepting the curiously persistent pneumonia, it is the main cause of sickness and death, 1,600 cases, or nearly five percent of the employees having been in hospital with it in February—a healthy month—and 15 died of it. There were only 500 cases of all other diseases, with 60 deaths. Infected mosquitos appear to be everywhere, though more prevalent at certain places, and it is said that unless a man take at least six grains of quinin daily, he is not able to resist the infection which is inevitable in spite of care to avoid mosquito bites. This is not pleasant reading nor is it pleasant to hear of the delay in screening the houses, nor to think of the possible consequences of six grains of quinin a day for ten years.

**The daily sick rate at Panama** is said to vary, according to season, from 2.5 to nearly 5 percent. Contrary to the statement in the January report, this would be an enormous rate for soldiers, who must of necessity be excused from duty for trifling illnesses, for which a civilian would not stop work and lose pay. If five percent of sol-

diers were as sick as these employes seem to have been, it would represent a rate of 15 percent or much more. There are nearly 40,000 employes and no civil community of this size in the temperate zone could support 12 hospitals and six dispensaries with more than 800 trained nurses and hospital staff and Lord knows how many doctors! Nor would it need 2,000 persons in its health department. Each baker's dozen of employes making the dirt fly require one person to keep diseases from them. These facts must be mentioned by those foolish people who claim that the zone is as healthy as any place in our South. The reports of excellent health do not seem to be verified. Were it not for an aggressive and extensive sanitary service, disease would stop the work. The results accomplished are really excellent, but are belittled by the optimism which conceals the real conditions. The men work at great risk and deserve proportionate pay and protection.

**The high deathrate of the first Virginia colonists** has a modern scientific interest, as people are now living in health where fever was then fatally prevalent. The first colony of the year 1585 failed by reason of deaths from fever and the attacks of Indians. There were similar experiences in 1587 and 1591, and England was full of bitter discussions as to whether it was possible to survive in Virginia. Then came Sir Walter Raleigh's historic effort of 1607, which is now being celebrated on Hampton Roads, but it, too, really failed, for in a few months 67 died out of a total of 105. The 38 survivors were enervated by fever and would have perished but for the arrival of more men with provisions. Then John Smith, the autocratic genius, kept them alive, but when he returned to England, the old disasters in a few months killed 440 of

the 500 people he left. The 60 survivors were a "haggard, disheartened, starved, cadaverous, miserable group of maniacal-looking men and women." They, too, gave up hope of success and sailed for home in June, 1610, but were opportunely met by a new governor with more recruits. Then individualism replaced communism. The best prospered and the worst failed individually instead of dragging down all. The colony became healthy and successful. It would be interesting to know whether the "fever" was typhoid or malaria. Perhaps it was typhoid brought with them, for the Indians did not seem to have it. Cleanliness and nourishment may have eliminated it.

**Sacrifice the Refractionists!** A bill has been passed by the legislature of Delaware which permits the opticians to "prepare eyes for testing," and "to test eyes and fit glasses to correct vision." At this writing the bill awaits the Governor's approval. It is a sorry blunder, but the sponsors of the bill, in order to secure support to exclude the Eddyites, were willing to throw the refractionists into the deep sea. The deplorable old error, hoary with criminal antiquity and rotten with scientific error, is that glasses are "to correct vision." Most good glasses are for no such purpose. They are prescribed by competent oculists in order to cure or to prevent local ocular and general systemic diseases. Opticians, by lack of medical training, cannot possibly be fitted to prescribe spectacles to cure and prevent disease. Better kill the law than insert such an obnoxious and stupid proviso. Other States should not be so foolish as Delaware.

**Lynching of negroes** has progressed to such a point that it bids fair to upset all our notions of murder. It is a problem which so far has defied cure and it defies impartial

discussion. It is defended and denounced both North and South, though there is a universal opinion that society is in a dreadful condition if it tolerates abuses so fiendish that a part of the community is goaded into a frenzy of murder, which is as bad as the slaughter of Jews by Christian Russians, or the wholesale massacre of Christian Armenians by the Turk. Cannot the medical profession seek out the cause and pave the way for the suggestion of a cure? Why does the free negro show such a "irresistible impulse" to rape white women, while the slave did not? There must be a discoverable and removable cause. It is a question for science and not theology or pedagogy.

**The negro brain** has been investigated for a long time by Dr. Robert B. Bean, of Baltimore, and he has recently epitomized his discoveries in a popular article in the *Century Magazine*. He calls attention to the wellknown fact that the negro brain is considerably smaller than the European and particularly the northern types grouped together as Anglo-Saxon. His most important statement is the fact that the negro not only has fewer brain cells, but also fewer of those connecting fibers, which by their number distinguish the human from all other brains. It is, therefore, more animal in type and incapable of producing those thoughts which have built up civilization. The near brain is well developed so that the negro is emotional, even to the point of possessing considerable artistic ability of the more sensual variety. His brain shows why he lacks self-control under provocations, and why his sensual acts, normal to the jungle, are uncontrollable in civilization.

**The education of the negro** is touched upon by Bean, who rightly states that no

amount of training will cause that brain to grow into the Anglo-Saxon form. He has thus shown the anatomical basis for the complete failure of negro schools to impart the higher studies—the brain cannot comprehend them any more than a horse can understand the rule of three. Negro education must, therefore, be circumscribed by these mental limitations—a fact known practically for fifty years. The mulatto or quadroon is able to go higher and furnishes the bulk of the negro successes in business and the professions. It seems dreadful that we did not know these anatomical facts when we placed a vote in the possession of this brain which cannot comprehend its use. Leaders in all political parties now acknowledge the error of human equality, and the common thought is in the direction of rectifying the matter. It has been said that he would have been better off and been better treated if he had not been enfranchised, though this was vehemently denied by his friends of a past generation who believed that he would have been reenslaved. Now that such an outcome seems impossible, it may be practicable to rectify the error and remove a menace to our prosperity—a large electorate without brains.

**The brains of other lower races** should be studied in the same way. It is high time to call in anatomy to the aid of statesmanship to determine whether we have not injured the nation by placing it in the power of types so lacking in brain that they never can be educated to the point of being trusted with Republican institutions. We may have squandered our birth rights, purchased by the blood of ancestors. We seem to be drifting into dreadful political chaos when so many hundreds of thousands of stupid voters will rally around the most vicious of demagogues. Science may show where the

trouble lay, and point the way to some practicable scheme for limiting the franchise to those who can use it, and disfranchising those who abuse it or sell it. The medical profession has a grand opportunity to help stem the tide of civic corruption which is overwhelming the nation. The investigations into the brain anatomy of different races are vital matters and should be prosecuted with vigor. We are reaping a harvest of crime from our neglect to cultivate this field. Pedagogues and clergymen have assured us that education and religion will cure our civil ills. Yet we have the worst record of any civilized nation in spite of the most extensive school system and our well-known piety. We must explain why this is, and the study of brains of lower races among us might give us a clew.

**Accidents due to fatigue** are receiving more and more attention in Europe though not so much in America, apparently, as a few years ago. It is said, that a long time back, the Bank of England discovered that mathematical errors of the clerks were at a minimum in the early morning hours but progressively increased as fatigue occurred. The worst time was in the late afternoon and there was so much money loss, due to errors at that time, that as a matter of economy the clerks were forbidden to work after a certain hour, which we understand was three o'clock. Similar statistics as to accidents have recently been published in France, and the same law of sequence was brought to light, as was to be expected. The number is at a minimum in the early morning hours, rises slowly until noon, takes a sudden drop after the midday rest and then rises to a much higher point at the end of the afternoon than it was at the end of the morning's work. All this needs no explanation, for the cause is self-evident.

**The reduction of the hours of labor** has been man's policy, since prehistory, for it is natural to make the struggle for existence as easy as policy. Our trades-unions are apparently wedded to the eight hour plan and all indications point to its final accomplishment when they will take up a new shibboleth to make life still easier. They seem to have natural law on their side, but it is remarkable that employers do not recognize the logic of events as the Bank of England did. More work and better work and, therefore, cheaper work is done when the men are fresh. Fatigued men are too expensive to hire at any price; unfortunately no hard and fast line can be drawn. Some labor is so exhausting that two or three hours unfits the laborer for a day or two—driving the limited express, for instance. Yet intermittent labor, which does not require close or intense mental application, can be safely continued ten or twelve hours or even longer.

**The prevention of fatigue accidents** can be brought about in but one way—by making them too expensive. As soon as a corporation discovers such a cause, it instinctively reduces the hours of labor, as a matter of economy. The sufferings of the laborers or the loss of life do not appeal to us as much as loss of money—an unhappy fact we have repeatedly, yet sorrowfully, mentioned. Suits should be decided in favor of the injured, and the damages placed so high that it will be cheaper to prevent—due precautions being taken to detect fraudulent claims. Nevertheless, it is a pleasure to note an increasing tendency throughout the world to reduce labor to a point where it can be done efficiently. Conditions do improve even if the millennium is not yet in sight.

**Night labor** is another economic problem having a psychic basis of interest to phys-

icians. It has been found by experience that for equal times it is not nearly so efficient as that done in daylight. In certain factories, the night shifts have been discontinued because the product was poor and the cost inordinate. A return to nature was the logical result. There is also much evidence that night labor, which reverses our natural habits, is too destructive of the organism, and when it is necessary it should, therefore, receive a much higher wage.

**Obesity as a disease** is at last receiving a trifle of the attention it deserves—and by obesity we do not mean the normal embonpoint which comes with middle age, for that is unavoidable in spite of Horace Fletcher and his disciples. It has long been known that alcohol, arsenic and phosphorus cause the deposition of fat which sometimes goes to the extreme of a change of cell contents into fat. Recent experiments in lower animals with lead, strychnin and morphin have induced fatness. These facts have given rise to the theory that obesity is a toxic disease in which the poison interferes with normal metabolism. One writer (*La Presse Médicale*, July 25), carries the idea a step further and similarly accounts for the obesity accompanying or following certain infections, as for instance in the convalescence of typhoid or occasionally in tuberculosis. Indeed the condition has been experimentally produced by injecting certain organisms.

**The neurotic basis of excessive obesity** is ignored in all of these discussions. It is most noticeable in the obesity of childhood, but is equally evident in that of adults. They are defective in many ways, lacking in vitality, rarely live to old age, subject to numerous complaints of nervous origin, and prone to certain infections. The fierce swine-like appetite is of itself a stigma of

abnormality, and although there is some evidence that cases exist in which the food ingested is not excessive, it is quite evident that it is too much for the work done. Normally, in youth, the appetite diminishes as the body is saturated but not so in the obese. The new theory would lead us to believe that in some cases the food is proper in amount for heat and energy, but is packed away as fat and the man derives his heat and energy from nothing.

**The treatment of obesity** according to the most successful specialists is mostly dietetic and includes accurately graded exercises which strengthen the heart but do not strain it. The new idea would seem to indicate that elimination of toxins is an essential also—a matter usually attended to in the treatment of the digestive tract and by hydrotherapy, external and internal. Oxidation is encouraged, appetite restrained and toxins eliminated. In spite of all our successes there must be incurable cases, where the nervous defect—the original cause—is a congenital one and irremediable. The chronic toxemia apparently accounts for the lack of resistance to bacterial invasion. They even melt away from tuberculosis so that this disease is more likely a result than a cause. It is generally believed that some men can eat too much and yet not fatten, the excess being oxidized and the heat radiated. This is doubtful. The excess probably passes through the alimentary canal unchanged from inability to digest so much, and gives rise to intestinal diseases and not those of metabolism.

**The Department of Education of the State of New York** has approved the bill passed by the State Legislature for the establishment of a single medical examining board and the abolition of all sectarian distinctions in the licensure of medical graduates.

## CORRESPONDENCE.

WHY NOT ADHERE TO THE UNITED STATES  
PHARMACOPEIA?

BY

RICHARD B. FAULKNER, M. D.,  
of Pittsburg, Pa.

*To the Editor of American Medicine:*—A physician's prescriptions show the spectrum of his character. There is an art in the writing of prescriptions. The modern investigation of diseases, the increasing exactitude in medical methods, the advanced knowledge of symptomatology, and the more certain means in diagnosis demand more care, more skill, more experience in the employment of medicines. Suitability in the application of prescriptions is becoming constantly more individualized. What is adaptable to one case, is becoming less adaptable to another. The successful therapist must be experienced, of good judgment, tactful and honest.

The standard for quality of all drugs and chemicals is established by the United States Pharmacopeia. This Pharmacopeia, prepared and revised in convention by representatives from the schools of pharmacy, colleges of medicine, the army and navy, *is the one great authority, equaled by no other*, and accepted by all pharmacists and physicians. *It creates the standard for purity, quality, and preparation of drugs and chemicals.*

The alkaloids, extracts, elixirs, tinctures, solutions, syrups, and synthetic products of the United States Pharmacopeia represent the highest degree and latest pharmaceutical knowledge and skill.

Physicians who prescribe in accordance with the Pharmacopeia, know exactly what they are using, and can predict with reasonable certainty their proper effects. They become more accurate in the writing of prescriptions, in that they have entire opportunity for judgment in increasing, diminishing, eliminating or adding any ingredient, or in varying the proportions according to the effects. Such prescribing keeps one ever thinking of the physiologic, toxic, and therapeutic action of drugs; increases knowledge of the same, and lessens the danger of accidents. It gives a wide range for selection; broadens the character and adaptability of prescriptions, and increases their precision and efficiency. It also crystallizes our knowledge of drugs and chemicals, leads to wiser choice, and avoids the con-

fusion of an ever increasing polypharmacy. There are no pharmaceuticals more elegant than those of the revised Pharmacopeia.

Certificates of foreign professors, asserting the efficacy of "anti" this or "contra" that, would become innocuous, if physicians would prescribe in accord with the Pharmacopeia.

The evils and delusions of tablet triturates would become a thing of the past if physicians would adhere to the Pharmacopeia. It is impossible for tablet triturates to equal in efficiency the fluidextracts of the Pharmacopeia. By such prescribing is obtained a sure way to prevent substitution. There would then be no advantage in substitution. It will also encourage and foster legitimate, honest, pharmacy.

The principles of ethics of the American Medical Association, insofar as they relate to patented and secret medicines, would have no bearing at all if all physicians prescribed in accord with the Pharmacopeia. How can conscience and intelligence permit the usage of any medicine, the nature of which is not fully known? It is unquestionably most ethical to prescribe in accordance with the Pharmacopeia, but, aside from ethics, is it not, also, most judicious? The wholesome authority of the Pharmacopeia merits a more general and conscientious support of the profession. While we doubt that one percent of the physicians of the United States have ever seen a copy of the Pharmacopeia, it is certainly advisable that every physician should possess a copy of it, or, of one of the standard commentaries upon it (which embraces the Pharmacopeia), either the United States Dispensatory, or the National Standard Dispensatory.

If the American profession, with its conscience and intelligence, would adhere steadily to the Pharmacopeia, dishonest pharmacy, fake chemists, cut-rate, substitution pharmacists, patented, registered and proprietary nostrums would rapidly disappear. Conscience, intelligence and the Pharmacopeia form a strong bulwark against ignorance, avarice, deception, and fraud.

**Tuberculous Cows in New Jersey.**—It is the opinion of some of those conversant with the conditions, that in the neighborhood of 40 percent of the milch cows in the State of New Jersey are tuberculous. In order to encourage farmers to have their stock inspected, the State Commission on Tuberculosis in Animals is paying full value for animals killed. Recently 20 cows out of a herd of 40 were found tuberculous and were condemned, the owner receiving full compensation.

## ORIGINAL ARTICLES.

### THE VALUE OF DRUGS USED TO ASSIST LABOR.<sup>1</sup>

BY

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of Detroit, Mich.

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The classification of drugs used to assist labor admits of three divisions, respectively, those producing tetanic contraction of the uterine muscle such as ergot, *hydrastis canadensis*, cotton root, etc.; those producing normal contraction as kola, quinin, *cimicifuga*, glycerin, sugar, etc.; and those which act as general systemic tonics, stimulants, eliminatives, narcotics, and anesthetics. If small doses of the drugs belonging to class one are given, the result may show, in most instances, no tetanic contraction of the uterus.

The therapy of labor, if studied scientifically, must necessarily find a close relation to the physiologic process by which the female expels from her uterus and vagina the mature ovum at about 280 days after the first day of the last menstruation. Unfortunately we do not comprehend, except in an indefinite way, the law of the organism. Doubtless we can, without question, accept the view that labor is due to a combination of conditions, no one of which can be analyzed and yield a sufficient and complete explanation of the process. Analogous studies of plant and insect life contribute much to our knowledge of the maturity of the ovum. The chrysalid of the papilio is literally packed in a narrow cell until mature, when a frothy liquor is disgorged for the purpose of dissolving the glutinous material which gives solidity to the chrysalis, and this at last yields to the efforts of the enclosed insect. This is a much simpler process than is observed in maturity of the human ovum, the chief factors of which are enumerated with considerable uncertainty. In drug therapy five of these factors are interesting considerations.

<sup>1</sup> Read before the Wayne County Medical Society, Detroit, Mich.

The first, increasing irritability with intermittent contractions becoming steadily stronger admits of supplemental aid from the drugs belonging to one or all three classes. Ergot and other drugs of the same physiologic type exhibit power in full doses to influence tetanic uterine contractions. All unstriated muscular fibers are stimulated. Hemmeter has demonstrated that uterine contractions result from stimulation of the centers in the lumbar portion of the cord. When ergot is administered in small doses, 0.6 cc. (10 minims) or less, the effect is that of a stimulant to the normal intermittent contractions.

The nontetanic group of drugs produce a varying effect upon well-established contractions: Quinin in doses of 0.65 gm. (10 gr.), fluid extract of kola in 1.9 cc. (30 minim) doses, sugar, 32 gm. (1 oz.) doses, fluid extract of *cimicifuga* 3.75 cc. (1 dram) doses, have resulted in a strengthening of the pains. It would be interesting to ascertain how this effect is obtained. Aside from the cardiac and circulatory stimulation, there may possibly be a stimulation of the uterine motor area in the medulla.

Changes in the decidua can be hastened by glycerin when it is injected high up into the uterus between the ovum and uterus. The effect of irritation and osmosis is also produced and labor is in most cases promptly established.

Relaxation of the cervix can be materially assisted, in fact sometimes compelled by general anesthetics, and some workers have obtained good results from local treatment using cocaine and belladonna. In cases in which the upper segment is adequately large and the *increasing tension of the muscular walls* is not marked nor the stronger fetal movements prominent on account of increasing confined space, and the lower segment remains stubbornly unrelaxed, anesthesia carried to the second stage will compel or assist complete dilation. The aid it renders to bimanual dilation is well known to all obstetricians.

In the first stage of labor there is not infrequently a marked disproportion in the innervation of the upper and lower segments. A noticeable inertia obtains in the lower segment.

This condition is observed frequently in neurotic patients and prevails more often in labors beginning late in the afternoon or early evening. The physician is summoned usually between nine and twelve o'clock. Examination reveals that several of the nine or ten causes of the onset of labor are present. There is increasing irritability with strengthening intermittent contractions, increasing tension on fully developed muscular walls, stronger fetal movements in more confined space, menstrual periodicity, and an exciting cause of emotion. Vaginal examination finds the lower segment without the slightest relaxation and the presenting part of the fetus does not exert any appreciable pressure at Bandl's ring. The therapeutic indication is best met with morphin or chloral. If the emotional symptoms prevail and pain is not strong enough to prevent sleep, 0.65 or 1 gm. (10 or 15 gr.) of chloral given with 236 cc. (8 ounces) of hot milk will enable the patient to sleep well until morning, when the lower segment will be found softened and dilated from the size of a quarter to larger than a dollar and the presenting part has descended and is in position for further advance in the lower segment. A strong cup of coffee or any general stimulant with exercise and a movement of the bowels will suffice to establish good effective pains for delivery in from four to ten hours.

If pain is equally predominant with the emotional symptoms, morphin and chloral are advantageously combined. In the majority of cases this combination is preferable to morphin alone, as the immediate effect is more complete and the gastrointestinal sequels less. The physiologic action of these drugs proceeds from the central nervous system, by direct sedative effect upon the cortical cells of the brain and from an effect upon the medulla, which controls important reflexes related in some way to uterine action.

The value of general anesthetics as a means of control should be given due consideration in cases of labor which give evident proof of undue haste or precipitation, thereby endangering the integrity of the soft tissues. Transient anesthesia may be produced frequently enough

to enable the accoucheur to guide and control the progress of the fetus in such a way as to accomplish the best possible accommodation of the passenger to the canal.

The use of drugs to assist labor requires a good knowledge of the approximate time required for the desired physiologic effect, and this will, under certain circumstances, determine the particular drug or drugs selected. The general anesthetics and all drugs administered by hypodermic injection are expected to act in approximately five minutes. If given by mouth, ergot, quinin and most other drugs of their class manifest beginning effects in from 15 to 45 minutes, reaching full physiologic action in from one to four hours. There is a wide variance in the action of drugs given when labor is in progress; not only do the factors of absorption and elimination signify, but the character of the labor, with the mental and nervous temperament, determine much as to the results obtained.

In considering drugs of class one, or those producing tonic contraction, the weight of opinion among obstetricians of large experience is against their use until the uterus is empty, and the postpartum use of these drugs is not within the scope of this paper. In a recent symposium,<sup>1</sup> Drs. E. P. Davis, J. C. Cameron, Stricker Coles, and Wilmer Krusen advocated the routine use of ergot after completion of the third stage, but Dr. Barton Cooke Hirst says: "It is his practice to give ergot as soon as the child's body escapes from the mother and he has not in 15 years of practice seen any disadvantage from its use, and his reason for so doing is having had in the early part of his practice some serious cases of postpartum hemorrhage and relaxation of the uterus." The position taken by Dr. Hirst is a little peculiar. He gives ergot for its postpartum effect, by mouth, as a routine practice at the time of expulsion of the body.

It is well known that the placenta is sometimes expelled against the lower segment or even into the vagina at the identical time that the child emerges from the vulva. Of what possible value can ergot, given by mouth, which requires 15 minutes or more to produce contraction, be in such a case

<sup>1</sup> Therapeutic Gazette of January 15, 1906.

if severe hemorrhage takes place and exsanguination is complete before the desired effect is obtained? If deep hypodermic injection into the thigh or buttock is done immediately upon expulsion of the placenta, the same result is obtained in one-third of the time and without danger of tonic contraction upon the placenta, which may separate slowly and with difficulty from the uterine attachment.

If Dr. Hirst had specified a dosage of 0.6 cc. (10 minims) or less of ergot given every hour or two to assist in normal contraction of the small unstriated muscle fibers, there would not be danger of tonic contraction during labor or dangerous relaxation at the end of the third stage.

It is important to remember that quinin, cimicifuga and like drugs should not be given in small doses or the result will be lessened reflex activity; 0.65 gm. (10 gr.) of quinin, for example, should be administered early enough to secure the full effect.

A more thorough understanding of the therapeutic values of drugs used to assist labor will doubtless restrict their use. Labor is intended for a normal process. The deviations met are not due, in the majority of instances, to abnormalities of the fetus and birth canal, but to abnormalities of the physical and mental systems as a whole. Increasing attention should be given to the hygiene of pregnancy. The environment of the patient immediately preceding and during labor should be one that begets confidence, control, and passive submission.

The physician, when called to a patient in labor, should do much more than make a vaginal examination and palpate the abdomen. The whole patient must be examined and all requirements contributing to the best possible physical and mental equipment should be promptly met. Symptoms of acute indigestion should be immediately cared for by an adequate dose of one of the digestants. Gaseous distention of the bowels should be relieved by turpentine enemas. Acute cystitis due to frequent urination should be relieved by 1.25 or 2 cc. (20 or 30 minims) of tincture of hyoscyamus.

A troublesome diarrhea should be controlled by a single dose of opium or a rectal injection of hamamelis. A tonic, stimulant, eliminative narcotic or whatever the general system requires should be administered with the ultimate purpose of contributing to the success of nature's greatest operation.

[Since writing this paper I have had an alarming postpartum hemorrhage occur from the administration of 1.3 gm. (20 gr.) of euquinine.—J. E. D.]

## ARTHRITIS DEFORMANS IN CHILDREN WITH A REPORT OF TWO CASES.\*

BY

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I wish to report two cases of chronic polyarticular osteoarthritis in children. Unfortunately, however, the reports are very incomplete and lacking in many points which would be of interest, but still, on account of the rarity of the condition, they seem to me to be worthy of being placed on record. Both cases occurred in a family of the better laboring class, not very far from here, in the North Carolina mountains. I never saw either patient in any way professionally, otherwise the reports would not be so very incomplete. The first patient I saw about ten years ago in my medical student days, when I was in the mountains on one of my summer vacations, and it was at this time that most of the following history (Case I) was obtained. Some few additional points were given me by the mother some years after his death at the time the notes and photographs of Case II were taken, in September 1904. Both patients had, I believe, been treated at different times by different doctors, but what their diagnosis had been, or what the treatment, I do not know. I feel that I must apologize for the incompleteness of these reports, but on account of the way in which they were obtained, this could scarcely be otherwise. The mother was rather an unusually intelligent

\* Read before the County Medical Society, Asheville, N. C., May 7, 1906.

woman for her position, and so far as the reports go they are unquestionably correct.

CASE I.—F. A., boy, aged 18. September 24, 1896.

Family History:—See Case II.

Previous History:—Till 11 years old, he was unusually strong and healthy.

Present Illness:—At this time, in March, 1890, he is said to have had an attack of grip after which he was never strong again; during this attack all his joints were sore. Shortly after apparent recovery from this condition he was out in a rain and got wet; the pain in his joints returned and this time was very severe, making him cry out at night. The joints were also swollen, and the right knee remained so for a long time; stiffness of the joint was marked, though in a short time he was able to bear his weight on it. At this



CASE II. J. A., aged 12.

time he was affected with a nervous twitching, said to have been chorea, which was so severe as to prevent his feeding himself or walking. This condition lasted for several months, but in the autumn (of 1890) he was so much better that he was able to go to school, and he remained fairly well for 18 months (till the spring of 1892), being able to work and go to school much of the time. In the spring of 1892, he lost his appetite and began to lose weight, and his joints, especially the knees, again became painful; under treatment he improved and was able to work during the summer. Early the following winter (1892-93) he got bad again; joints became swollen and painful, and he had to take to crutches, which he was able to use till the following February (1893), after which date he was never able to walk again. The

ankles, elbows, and wrists were affected after the knees, then the fingers and thumb; the swelling being particularly marked in the middle finger and thumb of the left hand. In the autumn of 1894, a seropurulent discharge began to take place from the skin of the dorsal and lateral surfaces of both feet and both ankles which at this time were greatly swollen, just as seen in photograph of Case II, practically all the joints of the foot being affected; it was more like an oozing, somewhat similar in character to what occurs in cases of severe edema of the feet and legs, except that instead of being serous the discharge was seropurulent and later became purulent; the discharge was sufficiently profuse to require daily dressing; large thick scales formed on the weeping and later ulcerating surfaces, which every now and then would come away, new ones forming in their places. The raw surfaces were all superficial, having no connection whatsoever with the joints. This condition lasted altogether for about two years, on the right foot rather longer than on the left. The toe-nails became diseased, and eventually all the nails came away, the matrix being destroyed; the discharge ceased, and the skin became apparently healthy again and remained so till death occurred, about a year later, in 1897.

About the same time that the skin of the feet became affected, his right eye was attacked. The trouble began with severe pain and aching in the back part of the eye and inside of the head. The lids were swollen, the eye became inflamed and bloodshot, lacrimation and photophobia being very marked; this condition lasted for about a fortnight, when the severe symptoms subsided; vision began to fail from the outset; for two or three months he could see a little, but sight gradually grew less. At the present time he cannot distinguish a candle, but can tell when a light is brought into the darkened room.

Present condition and general appearance, over six years after the original onset of the disease, are very much like that of his brother, Case II, as seen in the photographs. The anemia, emaciation, muscular atrophy and joint involvement are equally marked; eight months ago he weighed 72 pounds, now, doubtless, considerably less. All joints are greatly swollen, hips, knees, ankles, elbows and wrists, practically all the joints of hands and feet, the phalangeal joints as well as those of the carpi and tarsi, the shoulder-joints show less evidence of disease. In some of the joints, especially the wrists, the bones seem to be forced apart,

the swollen joints have a pulpy feel though rough and hard in places (the result of the osteophytic growths). Both feet are very much swollen and the surface rough looking, not unlike elephantiasis. The chest is very protuberant, especially to the left, there is lateral curvature of the spine, with concavity to the right; rigidity of the whole spine is very marked, with swelling and tenderness of the joints of the lower dorsal and lumbar portions. There is very pronounced weakness of the spine, and he is unable to sit up. This condition of the chest and back began early in the disease and has been gradually getting worse. The cornea of the right eye is hazy; pupil almost occluded by contraction and with exudate through which there seems to be a minute opening in the center. Heart action varies greatly, sometimes slow, sometimes fast; at times quite feeble, at times irregular and intermittent. He complains of a feeling of fulness and oppression at these times, and says it feels as if there were not room for his heart to beat.

Sometimes he has some trouble in passing his water, and it is always slow in starting. He is usually constipated. The boy gradually became more emaciated and weaker, and died in 1897, about a year after these notes were taken, and over seven years from the onset of the disease.

For the last four years of his life he was absolutely helpless, being unable even to feed himself.

CASE II.—J. A., aged 12. September, 1904. Family History:—Father and mother living, the latter in good health, the former, a farmer, shows some symptoms of a chronic endocarditis and nephritis, though he is able to work much of the time. Eight brothers and sisters are living and unusually healthy looking; one brother died of pneumonia followed by empyema at the age of seven; another brother died at 18, as described above. (Case I.)

He is the seventh of 11 children. Two great uncles are said to have died of "consumption."

The mother is said to have suffered for some time in her early life from some skin disease of a very indefinite nature, from which her mother also suffered.

Previous History:—He had whoopingcough when three years old and later what was called "walking typhoid," otherwise he was always strong and well till the present trouble began.

Present Illness:—In April, 1901, when eight and one-half years old, he began to limp, and a slight puffiness with some tenderness was noticed under each knee cap. Soon the whole knee-

joints became swollen and painful, the pain being worse at night. The shoulders, elbows, and ankles were next affected in the same way and later the left wrist-joint and the last joint of the left thumb; pain has been very severe much of the time, especially at night, when he often wakes up crying out with pain.

One month after he was taken ill he took to crutches, and used them for nine months, till February, 1902, since which time he has not walked at all. So far as his mother can tell he has never had any fever, but sweating has been very profuse all through the illness.

On December 22, 1903, he was seized with very severe pain in his left eye, most severe posteriorly; the eye became red and inflamed, lacerimation being very marked; four days later vision began to fail in the affected eye and has been gradually diminishing till now he can merely distinguish light from darkness.

Present Condition:—The accompanying photographs give a better idea, than can any verbal description, of the general condition and appearance of the patient. They were taken about three and a half years after the onset of the illness, at the same time as the present notes were taken, and about six months before death occurred.

The child is exceedingly anemic and emaciated. Atrophy of all the muscles is very marked, especially in the lower extremities, which look like pipe stems, there being little left but skin and bone.

The left hip is dislocated posteriorly, the joint being greatly swollen. The left thigh is so adducted that when the child is on his back, it lies over the right hip. Both thighs are fixed at right angles to the trunk, and the legs at acute angles on the thighs, and are all immovable. The knees are both greatly swollen, and rounded, puffy between the bones, which seem to be a finger's breadth apart. The ankles are also greatly swollen, as also are the tarsal and metatarsal joints, causing a more or less uniform enlargement of the whole feet, this enlargement being firm but puffy. The left foot is partly covered with a heavy whitish scale, which the mother states comes off every now and then, and then reforms. The elbow-joints are not so greatly swollen, though the forearms are markedly flexed on the arms, and there is slight motion in the joints. The left thumb nail is enormously enlarged and elongated, and excessively tender.

Lateral curvature of the spine is very pronounced, the concavity being to the left; the right side of the chest is enlarged and bulging.

Bedsore have been present for months. The position in which the photograph shows the child is the relative position in which he lives, that is, there is no change in the relation of the different parts of the body to each other, when he is changed from a sitting to a recumbent posture, for one portion of the body cannot be moved without moving all, except the slight motion in the forearms and fingers, and he is quite as helpless and almost as motionless as if he were carved in stone.

These cases are interesting on account of the rarity of the condition, as a whole, and also, on account of the rarity and severity of the associated conditions or complications, with the exception of which they are more or less characteristic example of the severe form of arthritis deformans, as it occurs in children. This in itself is a condition of which we see very little and know even less. Garrod,<sup>1</sup> one of the most careful students of the disease, writing on this subject in 1895, says "the time is not yet ripe for any adequate description of arthritis deformans as it occurs in children, for the whole subject of the chronic joint diseases of children constitutes a chapter in clinical medicine, which yet remains to be written." He goes on to say that he is convinced that some cases, which on account of their clinical features, are classed as examples of arthritis deformans in children, are not truly of that nature. In order to impress upon my readers the rarity of the condition, I might say that I can find no mention of the subject at all in Holt's wellknown book on diseases of children; another author of a book on pediatrics dismisses the subject with the words, "though rare it has been observed."<sup>2</sup> A few years ago, Koplik<sup>3</sup> was able to find record of only 18 cases. In the 500 cases of arthritis deformans reported by Garrod,<sup>1</sup> only three began before the age of nine; and out of 110 cases reported by McCrae<sup>4</sup> only two were in children. Still<sup>5</sup> has reported a number of cases of chronic osteoarthritis in children, in which, in addition to the joint involvement, which in many cases was characterized by progressive effusion and enlargement, with absence of osteophytes, the periarticular tissues being more affected than the joint itself, there

was marked enlargement of the lymphatic glands and spleen. Since the publication of his article, this condition has been frequently spoken of as "Still's disease." It is very doubtful whether this is a specific entity, but it is probably merely a variety of arthritis deformans as it occurs in children, in whom, as McCrae<sup>4</sup> points out in explanation of this condition, there is a much greater susceptibility to lymphatic involvement than in adults. In the same way the absence of osteophytes may be explained by the absence of any marked tendency to calcareous deposits in children, as compared with adults, this tendency being, as a general rule, in proportion to the age of the patient, in health as well as disease. Out of 33 cases in adults of McCrae's series, 13 showed general glandular enlargement, and four enlargement of some of the lymphatic glands, and in about 10 percent of the cases in which splenic enlargement was looked for was it found. This indicates that lymphatic enlargement is a much commoner concomitant of the disease in adults than is usually supposed, but on account of failure to examine the patients thoroughly, it is overlooked. One of the most significant features of these cases is that they both occurred in the same family. This family predisposition, however, is a condition that has frequently been observed. The striking similarity of the two cases is very remarkable, both in the general manifestations of the disease and its complications, and in the deplorable condition to which they were reduced for some years before their death, as a result of the almost universal joint involvement.

I have photographs of only one of the patients, but for purposes of description they would do for both, since the pathologic conditions were so remarkably alike.

The trophic manifestations, for such we must consider them, in the feet, though of a very unusual type, were practically the same in both cases, though in Case I they lasted longer and were more severe, the onychia going on eventually to a complete destruction of all the toenails. The dermatitis was of an unusually severe type. I have found reference to only

one case<sup>6</sup> in which it went on to ulceration and crust formation, though in both of these such was the case. The trophic skin manifestations more commonly met are local edema and sweating, erythema and herpes. Another very unusual feature of each case was the eye involvement; in one patient it was the right eye, in the other the left, but in both cases it came on in exactly the same way and with the same results, practically total blindness in the affected eye, and also, in each, absence of any involvement of the other eye. The exact nature of the original condition it is impossible to state, but it doubtless originated as some form of iritis. The history is not unlike that of a tuberculous iritis, but that is such a rare condition, that it is hardly likely that such was the case.

Most authors are silent on the subject of ocular complications of arthritis deformans, though Howard<sup>7</sup> states that "among the frequent complications may be mentioned some diseases of the eye, chiefly iritis, which is apt to be relapsing" and Garrod states briefly that "scleritis, iritis, and conjunctivitis have been met," but goes on to state that it is a significant fact that a certain number of the reported cases have later proved to be gonorrheal rheumatism, of which these affections of the eye are not uncommon manifestations. In a very recent article on gonorrheal rheumatism, Rogers<sup>8</sup> reports a very interesting case, which clinically cannot be distinguished from arthritis deformans of a severe type, in which as a result of a double iritis, practically total blindness had resulted. He reports it as a case of polyarticular gonorrheal rheumatism from the fact that the first symptoms made their appearance during the later stages of an acute attack of gonorrhea. Though this is very good presumptive evidence in favor of this diagnosis, it seems quite possible that the association of these two conditions may have been a mere coincidence, and not one the result of the other, and the same may be said with even greater force of another case he reports in the same article.

I do not intend going into a detailed account of the symptoms and pathology of arthritis deformans, but I do want to review briefly the

chief theories as to its causation. Like all diseases the cause of which we know very little, there have been numerous theories as to its origin. Up to the time of Heberden it was not differentiated from gout and rheumatism but was considered a result of the combined action of the two diseases, hence the old name "rheumatic gout," which, being misleading and confusing, ought to be no longer employed, though we still hear it used by the laity, and unfortunately by members of the medical profession, too, sometimes. This theory of the causation of arthritis deformans does not give us any knowledge concerning the true nature of the disease, though it was held for a long time, and is still adhered to by some few writers on the subject. The idea that there is what we speak of as an arthritic diathesis, is in keeping with this theory, that is, that in certain people and families there is some inherent abnormal susceptibility of the joints, which makes them more liable to involvement under certain pathologic conditions than is normally the case, just as a neuropathic tendency in a family will manifest itself in one member in extreme nervousness, in another in hysteria, and another in epilepsy, so what we may call an arthropathic tendency will manifest itself in one as rheumatism, in another as gout, and in a third as arthritis deformans. That there is possibly a certain amount of truth in this arthritic theory is borne out by the fact that in a very large number of cases of arthritis deformans there is a family history of gout or rheumatism. Out of Garrod's 500 patients, 216 gave a family history of some joint trouble, either gout, rheumatism, or arthritis deformans, and in the McCrae series, the proportion was about the same. Nevertheless, this theory, as such, of the causation of the disease has been generally abandoned, and most authorities at the present time are inclined to attribute to it either a nervous or an infectious origin.

These two theories are, however, not supported by very much accurate knowledge, but are, up to the present time, the most probable theories that we have, and by one or the other most of the symptoms and conditions can be more or less satisfactorily explained.

With regard to the infectious theory, the idea is that the disease depends upon the action of either a specific microorganism, or one of several organisms. Of course, along with most other diseases the etiology of which we know little or nothing, one or more specific organisms have been described as a cause. In addition to these specific germs, one observer claims that the microorganism is an attenuated culture of *Staphylococcus pyogenes aureus*, another has described a small diplococcus, and others have suggested a tuberculous origin to the disease, while by some gonorrhea has been considered a cause. The fact that in 30 percent of the males a history of gonorrhea was given is not surprising; if we admit, as I suppose we are compelled to, that not less than 75 percent (and this is said to be a low estimate) of men have gonorrhea at some time in their lives, remembering, also, what is an undoubted fact, that a very great many of the patients considered cured are not cured, the infection very often remaining more or less quiescent for years without giving any marked symptoms. It is quite possible, however, that a certain number of cases, such as those reported by Rogers, referred to above, may be due to a systemic infection by the gonococcus; though this, so far, cannot be said to have been proved.

In a recent article Edsall and Lavenson<sup>9</sup> report 18 cases of chronic polyarthritis in which tuberculin was used as an aid to diagnosis; of these eight gave no reaction whatsoever, three a doubtful and seven a distinct reaction. Of these seven four were clinically undoubtedly cases of arthritis deformans, two chronic rheumatism and one "Still's" type of osteoarthritis. In this last there was a violent local reaction in the joints, some of the enlarged glands were removed, and were found to contain bacilli, but they did not produce tuberculosis, when inoculated into guineapigs, the bacilli probably being dead. The conclusion of these observers was that the case was one of chronic widespread tuberculosis. They also came to the conclusion, as a result of these studies, that while the effects of tuberculin are inconclusive, they believe their observations indicate that in a certain number of cases the

teaching of Poncet, that chronic polyarthritis is at times tuberculous, is correct. On the other hand McCrae used tuberculin in the spondylitic cases of his series and found it very reliable, and considers it a great aid to diagnosis in doubtful cases, for he had no reaction whatsoever in the cases that were clinically arthritis deformans. He is inclined, however, to believe more in the infectious than the nervous theory of the disease, though Osler, from whose clinic his cases are reported, is inclined to set more store by the nervous theory.

One of the chief reasons for the belief in the infectious theory is the fact that not infrequently the disease begins acutely with fever. And the reason given is, that it is said, in a considerable number of cases, to come on after one of the acute infections, as influenza and gonorrhea. We have already spoken of the possibility of the gonorrheal origin of the disease; with regard to influenza, it is not at all improbable that the so-called influenza is nothing but the first acute onset of the arthritis deformans itself, which has not been recognized as such. This also is very likely true of many of the cases which are said to follow an acute attack of rheumatism.

Before leaving the infectious theory, it ought to be mentioned that syphilis has been given a place in the list of possible causes, but that it has any direct causative relation whatsoever in the great majority of cases there is very little to show, though it may occasionally produce a chronic polyarthritis.

The nervous theory seeks to explain the manifestations of the disease by considering them the result of either central or peripheral disturbance of the trophic nerves supplying the parts affected. The fact that we can explain the frequently associated dystrophies of the skin, nails and muscles in no other way than as the result of some trophic disturbance, speaks in favor of this theory. Very marked muscular atrophy, out of all proportion to the joint involvement, and often coming on long before it could have occurred merely from lack of use, is a very common manifestation of the disease, and can be explained only by the nervous theory. The skin complications already referred to

and the subjective symptoms so often present, the numbness, tingling and burning felt in the diseased limbs, can also be explained only in the same way.

The fact that the joint and skin lesions of some of the spinal sclerosis, especially locomotor ataxia and syringomyelia, which are undoubtedly trophic in origin, are anatomically identical with those seen in arthritis deformans, speaks very strongly in favor of a nervous origin for the last named disease. Though a variety of ill-defined skin manifestations may occur in all the foregoing conditions, they are of the same general character; glossy skin, herpes, erythema, local edema, and sweating and onychia being the most common manifestations.

So far, the pathologic findings have not given us very much definite information with regard to the etiology of the disease. Neuritis has been found in several cases but it cannot be proved that it is not secondary; and a few cases have been reported in which atrophy of the anterior horns of the spinal cord with degenerative changes has been demonstrated,<sup>10</sup> but that it is the primary condition we are unable to state.

A recent German observer has come to the conclusion that none of the cases described as arthritis deformans in children are genuine examples of that disease, but he gives them a separate entity which he calls polyarthritis chronica villosa. In this condition the pathologic lesions are chiefly confined to the synovial membrane, the articular cartilages showing no destructive changes. This is very similar to the lesions which Still has described, and it is doubtless the same disease; but be that as it may, it does not throw any more light on the etiology of the condition, but if anything, complicates the subject by adding another disease to our list for which we cannot in any way account.

For all these conflicting opinions and theories there can be but one satisfactory explanation, and it is this: That under the condition spoken of clinically as arthritis deformans, several conditions different etiologically and pathologic-

ally are commonly included. This is the conclusion at which both Garrod and Still arrived, the latter describing three different conditions, distinct, clinically and pathologically. From an etiologic standpoint there are probably more. It is quite possible that some cases are tuberculous in origin, some may be gonorrheal; syphilis may be an occasional cause, as also some form of chronic fibrous rheumatism,<sup>5</sup> but in a very large percent of the cases it is as Osler says in his definition of the disease, "of doubtful origin," for which we can find no cause at all and it is these that are best explained by the neuropathic theory, though this is, of course, like most theories, which Goethe has well called "Cradle songs with which teachers lull their pupils to sleep," no real explanation, for it presupposes some ulterior cause which brings about the nervous disturbance, and of this, of course, we know nothing; the theory itself being a confession of our ignorance on the subject. With regard to the exact nature of the cause of the two cases reported, it is impossible to state anything very positively. We can safely exclude gonorrhea and syphilis, and the probability of a tuberculous origin seems very remote. The association with chorea in Case I might suggest a rheumatic diathesis as a determining factor, but this is purely problematic and very unlikely. On the other hand the osteophyte production (Case I) and the trophic manifestations would naturally lead us to class them as cases of genuine arthritis deformans, of the true cause of which, up to the present time, as already stated, we know very little.

Since arthritis deformans in itself is not fatal (cases scarcely ever come to autopsy till the late stages, when it is impossible to state what changes found are primary and what secondary), pathologic investigation of the disease is very unsatisfactory. It is likely, however, that before so very long, with our greatly improved methods of study in bacteriology and microscopic anatomy we shall know more about it than we do at present. In exactly what direction this knowledge is going to be, it is impossible to predict with any certainty. It seems very likely that a larger number of cases than

we at present imagine will prove to be of tuberculous origin, though this, to a great extent, is conjectural. The two generally accepted theories with regard to the cause of the disease, which are commonly considered antagonistic, it seems to me, may both be more or less correct, the one being really complementary to the other; that is a toxemia is brought about, the result of some infection, specific or otherwise, and, as a consequence, the result possibly of some selective property, some organic change is produced in the nervous system, probably centrally, which in its turn, on account of some trophic disturbance, produces the ordinary lesions of arthritis deformans, which would then be truly of nervous origin; and thus the two conflicting theories would be reconciled. Such a double cause is usually accepted as an explanation of the conditions found in anterior poliomyelitis, and it seems likely that a somewhat similar double explanation of arthritis deformans may some day bring us nearer the truth.

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### RESTORATION OF THE PERINEUM.\*

BY

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The anatomy of the female perineum has been sadly neglected in textbooks and treatises on anatomy. Almost without exception the male

perineum has always received careful attention, doubtless because the old lateral operation for stone in the bladder was one of the most successful and frequently performed operations since the dawn of surgery.

The anatomy of the female perineum can, for surgical purposes, be described as consisting of three layers, of which the superficial layer consists of the bulbocavernosi, on either side of the orifice of the vagina, the sphincter ani behind and the transversus perinei on either side, lying on the triangular ligament. The bulbocavernosi and the sphincter ani close the orifices of the vaginal and anal canals.

The action of the transversus perinei must be exceedingly feeble, if any, in studying the perineal center. It is present in 30 percent only of adult females. (Barker.)

The second layer is the urogenital diaphragm, composed of three anatomic layers, the triangular ligament proper, which is homologous with the obturator membrane, is dense and strong and undoubtedly of the greatest value in resisting intraabdominal pressure directed against it. Intimately connected with the superior surface of the triangular ligament, and corresponding to it in form, is the deep transversus perinei and above this the superior layer of fascia known as the deep layer of the triangular ligament. Since it is practically impossible to separate these three anatomic layers, and for physiologic reasons, I have described them together as one muscle, surgically speaking.

The third layer is the levator ani muscle, encased in its two layers of pelvic fascia—the rectovesical above and the anal fascia below. It forms the pelvic diaphragm, and in the perineal region rests on the urogenital diaphragm. This is the most important of all, since it is the muscular supporting layer. Its action is to draw forward, toward the symphysis, the rectum and vagina, to elevate the floor of the pelvis and to support the pelvic viscera. It is united to its fellow of the opposite side, in front of the anal canal, by decussating fibers, some of which turn downward to blend with the deeper layer of the external sphincter, and some are inserted into the anterior wall of the anal canal.

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The next fibers posteriorly are inserted into the side of the anal canal, and the next set posteriorly terminate in the anococcygeal raphe; and the most posterior fibers are inserted into the sides of the coccyx. We are only concerned here with the anterior portion of the muscle.

The pubic portion is divided into puborectalis and pubococcygeus. This portion has its origin in an oblique line on the posterior surface of the body of the pubes. Its most internal fibers, originating at the lower portion of the line, are separated from their fellow of the opposite side by about one-half inch. These most internal fibers pass directly backward and slightly downward on either side, along the lateral wall of the vagina, and are inserted into the space between the rectum and the vagina, decussating with one another and intermingling with the fibers of the deeper layer of the superficial sphincter ani muscle, as well as other muscles that enter into the formation of the perineal center.

Popular textbooks on anatomy, used in medical schools, have very little to say about this muscle in the female, except to say that the inner portion of the muscle in front, or the puborectalis, surrounds the anal canal in a sling, and as a general rule they fail to illustrate the entire muscle as seen in a dissection from below. Cunningham's textbook on "Anatomy" states that the puborectalis is the part which arises from the pubic bone, and is inserted in the central point of the perineum. Weisse in his "Practical Anatomy" shows a dissection of the levator in the female representing a loop inserted into the space between the vagina and the anal canal. Porier et Charpy also show the same thing. Deaver's "Surgical Anatomy" shows a distinct muscle surrounding the posterior vaginal wall. Waldeyer describes the muscle in the female as being inserted into the space between the vagina and the anal canal.

My own dissection has invariably shown some of the internal fibers decussating in front of the anal canal; and I have found that in all books in which a drawing of a dissection of the muscle from below is given, they show these fibers which surround the vagina.

*Injury.*—As the child's head descends, and finally passes through the orifice of the vagina, it acts precisely like a mechanical dilator and tends to rupture the soft parts at the point of greatest weakness. That is why the posterior vaginal wall is ruptured in the median line, from without inward, up to the posterior vaginal column. Above this point the tear never extends in the median line, but on one or both sides of the column, on account of the greater resistance of the column and the weakness of the tissues lateral to it. As we have just seen, the vaginal wall ruptures lateralward from weakness; so for the same reason the levator separates from its fellow of the opposite side, in the median line, down to the rectal wall, and if further room is needed the fibers inserted into the junction of the rectum and the anal canal are stripped off anteriorly and laterally, and it is only in exceptional cases that the loop itself is torn at the sides of the vagina, although Harris seems to think this is the rule.

In certain cases we have complete tears involving the sphincter and the anterior wall of the anal canal, because of the firm attachment of these fibers of the levator ani into the anal canal.

The bursting of the perineal center composed of the superficial muscles allows the anus to drop backward toward the coccyx, since the sphincter ani, being torn from its attachment in front, retracts backward toward the coccyx; or in other words, toward the bony attachment. When this occurs, the anterior wall of the anal canal prolapses on account of lack of support.

The superficial perineal muscles are torn in various ways, and often the tear is not in the median line, though the skin tear, in the majority of cases, is median. We frequently have the tear extending outward through the bulbocavernosus, and transversus perinei of one side, into the ischiorectal fossa, leaving the perineal center intact.

In other cases the tear extends down the median line, and the bulbocavernosus and sphincter are retracted in different directions, in the line of their fibers. In this latter instance the perineum will appear to be abnormally long,

whereas in the former case, the sphincter ani, being still suspended by the bulbocavernosus of the opposite side, the perineum will not be much elongated.

I would like to call attention to the great number of cases in which the levator fibers, as well as the urogenital trigone, are torn down to the rectum, and yet the superficial perineal muscles are not torn. As a result of the separation of the levator down to the rectal wall, this becomes the weakest portion of the pelvic diaphragm, and as Noble has shown, the tendency is to become more and more stretched and relaxed by the intraabdominal pressure which is focused at this point. In case there is an internal laceration of the levator fibers, without injury to the superficial structures, they will be found quite inefficient in holding up the pelvic structures, and we therefore have rectocele and cystocele occurring, notwithstanding that there seems, on superficial examination, to be a perfectly normal perineum. The diagnosis of internal separation is exceedingly easy if one is familiar with the topography of the levator and inserts one finger in the rectum and one in the vagina, and palpates the intervening tissues.

The general surgical principle that we should, in the repair of an injury, restore the parts to their normal relations, layer to layer, so far as is practicable, applies to the restoration of the perineum, and is precisely the same as that underlying operations for hernia, that is to say the identification and suture of the different layers in their original positions. If this principle could be recognized so universally that no operation on the perineum were done without that same care in separation and identification of the different layers that we observe in doing hernia operations, the details of the operation proper would soon settle themselves. There should really be no greater number of methods of repairing the perineum than for suturing a laparotomy wound.

As to the incision, any incision will be proper that exposes the muscles in such a way as to permit accurate treatment of the deeper structures.

MARCH, 1907.

*Author's Note:*—Early in 1906 I made an important change in the foregoing technic. I now always begin by making a longitudinal incision along the posterior vaginal wall continuing down the median line of the perineum until the sphincter ani muscle is exposed. The lateral flaps are raised by blunt dissection as described and the muscles and the trigone sutured as usual. The advantage consists in the ease with which the operation is done and the smooth healing of the linear wound which is closed by a continuous suture of plain gut.

I have in course of preparation a paper dealing with this point which is to be illustrated by drawings of original dissections of the structures involved. I have used this incision in 25 operations with perfect results in each case.

However, I do not believe in excising any considerable portion of the vaginal wall, for the reason that any apparent redundancy of tissue will soon contract when the muscular and fascial supports are restored. Furthermore, excision of a portion of the vaginal wall undoubtedly diminishes the elasticity and distensibility of the vagina and predisposes to rupture in subsequent labors. We should by all means avoid a rigid perineum and aim to produce a normal, elastic one, which performs its functions through the action of its muscles. In order to carry out this idea it is necessary that we should use buried sutures and restore the continuity of the levator fibers above the urogenital trigone, so that the muscle can have free play in its normal plane; for if we include the urogenital trigone in suturing the levators, their action in drawing the anal and vaginal walls toward the symphysis will be interfered with, because the muscles are tied down at this point to the firm triangular ligament, thus substituting in the perineum a fixed point which does not exist normally.

There can be no doubt of our ability successfully to include the levator fibers, the urogenital trigone and the superficial muscles in a single set of sutures, but it is unsurgical to include layers having different functions in a single set of sutures, for it is impossible to weld these three diverse layers together and expect to

restore the physiologic functions of the different layers.

M. L. Harris,<sup>1</sup> of Chicago, was the first surgeon deliberately to isolate the levator ani muscle and subject it to surgical treatment. He recognized a lateral tear of these muscles as they course along the sides of the vagina, and also considered that there was an overstretched condition which led to relaxation and backward dislocation of the rectum, and that this could be best corrected by an incision which exposed the muscle, permitting isolation of the muscle from its surrounding fascia and the excision of a portion, thus drawing forward the perineum and restoring its normal appearance. Personally I do not think the Harris operation based on correct principles. It is my impression that the levator loop is very seldom torn along the side of the vagina.

As before stated, the loop is torn down to the rectum, in the median line. I am certain that it is more correct in principle to restore this portion, even if somewhat exaggerated in size, than to excise a portion of the muscle in its continuity.

Noble,<sup>2</sup> of Atlanta, in 1903, described his operation for restoring the perineum. This operation consists of denudation, similar to Hegar's, as nearly as I can understand from his description. Through this incision he isolates and identifies the levator muscle in the lateral wall of the vagina, then opens the sheath of the muscle and brings it out for one-half or three-fourths of an inch. The suturing process is begun by sewing the vaginal wall and the rectovesical fascia, which lie on the concave surface of the levator ani muscle, by catgut stitches, up to the level of the levator loop. The levator muscles are then brought together by three catgut sutures.

Next the triangular ligament and the bulbocavernosus are brought together by a layer of buried sutures, and finally the suture which was begun in the vagina is carried up to the posterior commissure and down on the skin surface to the end of the incision, just in front of the anus, thus completing the closure of the incision.

Later he modified this operation by making a cut out through the inner edge of the muscle for three-fourths of an inch, and brought this portion together in front of the anal canal end to end.

The technic of the operation as I have performed it since 1902, without any important variations, is as follows:

The first step is the identification of the orifices of the vulvovaginal gland ducts on either side, just external to the remains of the hymen. A tenaculum forceps is now placed beneath these openings on either side, so that neither incision nor sutures will encroach on these orifices, and to limit the incision so that it will not encroach on the vulva.

Lateral traction develops a prominent fold at the mucocutaneous junction, which is now split from side to side, going entirely through the vaginal wall. At the ends of the incision a short cut with the scissors is made for one-half inch along the lateral walls of the vagina, in its long axis, in order to expose the muscles in case of internal injury. Blunt scissors are now pushed under the vaginal wall on either side for one inch, and the blades separated, thereby quickly raising the flap on either side, down to the rectal wall. The tip of the flap is now picked up with a T forceps and raised by blunt dissection for not more than one-half of an inch. The lateral denudation extends up to the levator muscle on either side. It is not necessary to raise the flap in the middle line from the rectal wall for more than one-half inch, for as we saw in studying the nature of the injury, in the great majority of cases there has already been some prolapsus of the wall of the anal canal, so that it is in effect one-half inch lower than it should be in front.

The next step is the identification of the levator on either side, which can be done by palpation. Then grasp the muscle with a forceps, and pull toward the median line. Still holding the muscle with the forceps, it should be completely loosened from any adhesions which may have formed between the inner edge of the muscle and the torn edge of the urogenital diaphragm. This is the most important step in the operation, for if we do not loosen the muscle so that it comes to the middle line easily and without tension, the perineum will be rigid and stiff and the results of the operation unsatisfactory. It is unnecessary and undesirable to separate the muscle from its sheath composed of rectovesical and anal fascia.

The next step is the introduction of the deep sutures. The first suture is placed not more

<sup>1</sup> Jour. A. M. A., 1897.

<sup>2</sup> American Gynecology.

than three-fourths of an inch in front of the anterior wall of the anal canal. The second suture is placed one-half inch below this, or nearer the anal canal, and the two sutures are tied, thus restoring the pelvic diaphragm. There is a great tendency to put in too many sutures here, and thus render the vaginal canal too narrow at this point.

The next step is the identification and suture of the urogenital diaphragm with two sutures, just superficial to the sutures placed through the levator ani loop. Identification of this structure is not difficult. It lies just superficial to the levator muscles, and if their margins cannot be seen, they can at least be felt by picking up the tissues with ordinary dissecting forceps.

The next step is the attachment of the sphincter ani to its proper point in the perineum, which is done by two sutures.

The next sutures embrace the posterior extremity of the bulbocavernosus on either side. They are carried immediately beneath the skin through the posterior end of the muscle. Two sutures are all that is necessary.

The flap now remains to be disposed of, and various methods may be adopted. One may trim off the edges of the flap laterally and introduce a suture similar to Emmett's crown suture, putting in a lateral suture on either side of the vaginal wall. This is a very good method. Another is to commence in the deep layers of the skin on the patient's left side and continue around through the mucous membrane of the flap and out through the opposite side, in the same way as an ordinary subcuticular skin suture. The advantage of the second method of treating the flap is that the deep layers of sutures are completely protected from any chance of infection from the vaginal secretions. This flap suture should be of silkworm-gut, in order to avoid too rapid absorption, which occurs quite frequently when catgut is used in the vaginal canal.

After the introduction of these sutures the skin wound will be seen to be not more than one-half inch long, as the operation is practically done in the vaginal canal; so a single suture in the skin surface is all that is necessary, in most cases, and never more than two.

This operation, as carried out, is practically without hemorrhage. The separation by blunt scissors is very rapid and the whole operation, according to this technic, can be carried out in all its details in from 15 to 20 minutes. It is exceedingly easy, since there are no measure-

ments to be taken and no estimates of distance to be made. One simply makes an incision, sees what is to be done and at once proceeds to carry it out. Recognition of the muscle is also exceedingly easy; and the triangular ligament can be found readily enough by following the directions given.

The chief objection usually raised to any operation in the perineum in which buried sutures are used, is that there is danger of infection from buried sutures, and that should infection occur, serious danger to the patient could arise and the results of the operation would be lost. This is unfounded. There is no part of the body that will better take care of buried sutures than the perineum. I have often used extra large 20-day gut simply as a test, and it has been taken care of without any trouble whatever. In about 50 operations which I have done personally I have not had a single infection.

In case there is complete laceration of the perineum, the injury to the anal canal may be managed according to the method of E. C. Dudley. I have never had a failure with it, and can consistently recommend it, as it is exceedingly simple and easy. Or one may use the method of Noble. He dissects in between the anterior wall of the anal canal and the vaginal wall, separating them to such an extent that the portion of the anal canal which has been injured is drawn completely without the anus and fastened on the skin surface of the perineum after having been sutured. (After a few days it retracts within the perineum and causes no further trouble.) He then finishes the operation in the regular way.

The results of this operation have been complete restoration of the function and form of the perineum. My first patient was operated on three years ago, and I have had an opportunity very recently to examine the result, and I find the union absolutely good between the internal edges. Noble seems to think that eventually separation of these fibers must occur and that the perineum will become thin. I do not think this is true, for the reason that in one case, in which too many sutures were placed, union has

been absolutely firm and some separation of the muscle by operation will be necessary before the size of the canal can be restored. This case occurred in the practice of a colleague of mine. I call attention to it in order that those who care to follow this method will not put in too many sutures. As before said, there is a tendency to do this when the muscles are relaxed by anesthetic, thus bringing about too great a narrowing of the vagina at this point.

## MASTOID WORK FOR THE GENERAL PRACTITIONER.

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Cases of mastoiditis occasionally fall under the observation of the general practitioner, to whom unfortunately, all cases appear similar. In other words, the average practitioner has not learned to distinguish between those forms dependent on chronic and those dependent on acute suppurative conditions of the middle ear, nor between acute inflammations of hitherto healthy mastoids, and acute exacerbations of chronic disease.

There are certain conditions which, according to the consensus of the best modern opinion, clearly indicate the necessity for some form of mastoid operation. They are as follows:<sup>1</sup>

1. Acute suppurative inflammation of the middle ear, accompanied by symptoms of mastoid involvement, or head symptoms of any kind, which persist for more than two days in spite of free drainage from the middle ear and proper palliative treatment.
2. An obvious abscess behind the ear as a result of acute mastoid disease.
3. Profuse discharge from the ear persisting in spite of treatment for more than two months after an attack of acute suppurative inflammation of the middle ear.
4. Acute mastoid disease occurring in the course of chronic otorrhea.
5. Chronic suppuration of the middle ear which persists in spite of a year's treatment by free drainage, cleanliness,

and local applications. 6. Cholesteatoma. 7. Fistulous openings in the mastoid. 8. Facial paralysis occurring in chronic otorrhea. 9. Intracranial complications of ear disease invariably demand opening of the mastoid process as a part of the search for the more serious lesion, provided of course that a complete mastoid operation has not been already performed.

If one would operate intelligently under any of the first three indications of the list, he should possess the following qualifications: A thorough practical knowledge of the principles and technic of modern operative surgery, a fairly comprehensive acquaintance with the descriptive and surgical anatomy of the temporal bone and associated structures, especially the positions and anatomic relations of the semi-circular canals, facial nerve, lateral sinus, and neighboring portions of the cerebrum and cerebellum, and lastly considerable personal experience in operative work, since his earlier experiences, at least, should certainly never be gained in this field of surgical endeavor. Given such qualifications, with, of course, a theoretic understanding of the proper procedure and the necessary facilities and environment, one need not be a specialist in order to operate. This, however, applies only to operation under the first three indications, since such operation bears about the same relationship to operation under the last six as the removal of pterygium bears to cataract extraction. The much more difficult, more radical, more extensive, and more dangerous operation which alone is admissible under the latter circumstances, demands of the operator that in addition to the foregoing qualifications, he possess a minute and exhaustive knowledge of the anatomy of the temporal bone and neighboring organs and structures, that he should have performed the operation many times on the cadaver, that he should have assisted in its performance many times on the living subject, and that, in short, he be possessed of that special knowledge and special skill in this particular branch of surgery which can only be obtained at the expense of knowledge and skill in other branches.

Let us examine the first three indications

<sup>1</sup> Mainly from Hunter, Tod, and Bishop.

somewhat more in detail. In regard to these it is necessary to emphasize the point that, if they are to be considered indications for what may be called the simple mastoid operation, the existent acute inflammation of the mastoid process must be dependent, not upon a chronic but upon an acute disease of the middle ear, and that this acute disease must in its turn be not merely an acute exacerbation of a chronic process, but an acute disease, *per se*, affecting a previously healthy ear. One is confronted, however, by this obstacle, that it is often difficult, and perhaps sometimes impossible, to determine the existence of a previous chronic suppuration. He, at least, who is not skilled in the subjective examination of the ear, is dependent for his conclusion upon the history of the case as elicited from the patient, a history which will often prove very misleading, since the discharge of a serious chronic suppuration may have been so slight as to dry within the meatus without attracting the patient's attention at all. Usually, however, if there be chronic disease, it will present obvious evidences to one who is accustomed to examine the drumhead and middle ear by speculum and reflected light, such evidences, *e.g.*, as a large perforation or the disappearance of a large part of the tympanic membrane and perhaps of portions of the ossicles, or a perforation with healed and thickened edges, or polypi, or granulations.

Being satisfied that the acute process is not formed upon an underlying chronic disease, the obstinate continuance of certain symptoms for more than two days after free incision or rupture of the drumhead, with warm antiseptic douching and the application of ice to the mastoid, would justify, or rather would demand a resort to the simple mastoid operation. The symptoms which point to such a necessity are pain in the mastoid region often radiating over the side of the head, tenderness on pressure over the mastoid antrum or tip of the mastoid, slight elevation of temperature, and bulging or sagging downward of the deep portion of the posterosuperior wall of the external auditory meatus. The absence of one or more of these symptoms would perhaps justify the postponement of the

operation for a somewhat longer period, but would by no means justify the diagnostic exclusion of mastoid involvement. Pain is sometimes slight or absent in spite of extensive destruction. Still less is the temperature to be depended on as a guide, as it is only in children that it is elevated with constancy in this disease. Tenderness is sometimes elicited only by deep pressure. It is often found first or in the earlier stages of the disease over the tip of the mastoid, but is perhaps more distinctly suggestive when it is most marked at a point directly behind the superior border of the external canal, a point in fact which overlies the mastoid antrum. It is important that the pressure be applied perpendicularly to the surface of the bone, and that care be otherwise taken not to disturb the fibrocartilaginous meatus in its relationship to the bony canal, since an apparent tenderness elicited without these precautions might be due to a furuncle of this structure. Bulging of the posterosuperior wall of the meatus near the tympanic membrane is perhaps the most pathognomonic sign of mastoiditis, but is nevertheless the sign most commonly overlooked by the general practitioner. When present, it interferes with one's view of the drumhead, except in the anterior and inferior portion. It should be distinguished from swelling due to furuncle, which affects the more external portions of the canal.

Operation having been decided upon, the patient's head should be shaved over an area within a radius of at least three inches from the external canal, the field being sterilized in the usual way, and the ear thoroughly irrigated with 1-5000 mercuric chlorid solution. A curved incision should be made one-eighth of an inch behind the pinna, extending from a little below the tip of the mastoid to a point above situated nearly as far forward as a vertical line passing through the external auditory meatus. It is much better that this incision should sever all the soft tissues to the bone at the first attempt, not only because time will be saved, but also because the bleeding can be more quickly arrested. The handle of the knife, however, should be held depressed to such an

extent that the edge of the blade is at a very acute angle, almost parallel, in fact, to the surface of the bone. If held more perpendicularly, there is some danger that the point may plunge through a fistulous opening. When all the bleeding vessels have been seized, the periosteum should be quickly separated from the bone with a suitable elevator. This elevation of the periosteum usually checks oozing at once. It should be sufficiently extensive in every direction, but it is of especial importance that it be carried forward to the posterior edge and slightly over the posterior edge of the bony meatus, without, however, greatly disturbing the fibrocartilaginous canal in its bony setting. The whole posterior and the greater portion of the superior rims of the bony meatus should, in fact, be exposed to the senses of sight and touch by this separation of the periosteum and soft tissues from the underlying bone. The temporal ridge should also be uncovered above. The fibers of the sternomastoid muscle must be separated from their attachment to the tip of the mastoid by a blunt pointed scissors curved on the flat, the concavity of which is held close to the bone. This separation should extend beneath the apex almost to the digastric groove.

The whole surface of the mastoid being thus exposed, it is essential that, before proceeding to open the bone itself, the operator should bear in mind that contained therein is an anatomic structure, which, throughout the balance of the operation, should be his distinct objective point. Unfortunately, many of those who have not had special training in this subject, are apparently not aware of this fact. Others, even occasionally among those of whom better things might be expected, do not appreciate its importance. Let it be stated then, in order to impress the matter both upon those who have not heard and those who have not heeded, first, that the blind removal of the mastoid cortex and drilling or chiseling into the substance of the bone is very likely to result in failure, since, times without number, pus, when it is present, is to be found only at the point of which I speak. This failure is not merely

bafling to the surgeon, but unfortunately, is often fraught with dreadful consequences to the patient. This objective point is the small cavity commonly called the mastoid antrum. It differs from the other cavities or cells of the mastoid process in being constantly present, and accessory, both developmentally and anatomically to the tympanum itself, since it is in direct communication with the latter cavity through a small passageway called the aditus ad antrum, which connects it with the tympanic attic. A line extending inwards at right angles to the surface and terminating externally in that portion of the surface known as the suprameatal triangle would reach the mastoid antrum after a course of from one-eighth to three-fourths of an inch. The suprameatal triangle, so-called, is a small, rather irregular triangular area, the base of which is formed by the posterior superior margin of the bony canal, and the sides by tangents to the superior and posterior margins respectively. A small bony projection, called Henle's spine, situated about the center of the base, serves as a useful landmark. But even were the suppurative processes entirely confined to the mastoid antrum and all other parts of the bone healthy, it would, of course, be necessary to remove the cortex over a much more extensive area than this, in order to obtain sufficient working room to enable one to penetrate to the necessary depth. The surgeon's endeavor, in fact, should be to remove a somewhat conical shaped section of bone, the apex of which corresponds to the mastoid antrum, the base to the surface of the mastoid. The base should be oval, with a superoinferior diameter of about one inch, and an anteroposterior diameter of about one-half inch. The upper edge of the base reaches to a point one-eighth inch below the temporal ridge, the anterior edge as close as possible to the bony canal without actually breaking down its posterior wall. The upper side of the cone forms a right angle with the base, passing directly and perpendicularly inward to the mastoid antrum. The lower side slopes sharply upward and inward to the same point. Both the posterior and the anterior sides of the cone

slope forward in their inward course to the antrum, but the forward slope of the posterior is much greater than that of the anterior. The whole of the cortex forming the base of this wedge or cone should first be removed with a chisel or gouge about one-fourth inch in width. This instrument should be held at as acute an angle as possible to the bone and driven in by light taps of the mallet. The greater part of the underlying spongy bone can usually be removed by the sharp spoon and a small rongeur forceps, though it is sometimes necessary to use the chisel or gouge. The operator, with a good light, should proceed as rapidly as possible in the direction indicated, making very frequent use of a probe to detect softened bone, cavities, a possible communication with the mastoid antrum, or an exposed lateral sinus or dura mater. He should constantly bear in mind that the farther he works backward away from the external auditory canal the more likely he is to wound the lateral sinus, and that, of course, the farther he works upward toward a horizontal plane passing through the temporal ridge, the more likely is he to enter the cranial cavity. Fear of entering the cranial cavity, however, is responsible for the very common mistake of commencing too low down, a mistake which greatly increases the difficulties of finding the antrum. The upper side of the wedge-shaped cavity excavated in the bone should, as already stated, pass perpendicularly inward from a point one-eighth inch below the temporal ridge. This wall of the cavity will be formed of a layer of comparatively compact bone, which marks the limit of safety upwards. A similar layer of compact bone overlies the lateral sinus. The antrum, when reached, can be recognized by the facility with which a probe, bent nearly at right angles at its tip, can be passed into the cavity of the middle ear. The mastoid antrum itself and the small passageway connecting it with the tympanic attic should now be very gently freed of granulation with a small curet, especial care being taken not to introduce the curet into the attic or middle ear itself, so as to avoid injury to the ossicles or other structures contained therein.

Irrigation with 1-5000 mercuric chlorid solution is advisable. If, as of course is almost invariably the case, there is a perforation of the drum, the fluid should escape freely from the external auditory meatus. A few deep sutures, including the periosteum, may be taken in the upper portion of the wound. The cavity should be packed with a narrow strip of gauze through the lower portion. General surgical principles are applicable to the further conduct of the case.

Most of the dangers of the operation have already been alluded to. It may be well to emphasize the point that the lateral sinus is best protected by slanting the posterior wall of the excavation as steeply forward, and the inferior wall as steeply upward as possible. Should the sinus be wounded, the hemorrhage can usually be readily controlled by packing, but it renders it always difficult and often impossible to complete the operation, especially when the cortex has not been widely removed. The facial nerve and semicircular canals are not likely to be wounded during the simple mastoid operation on adults, but this comparative assurance of safety can be greatly increased by the cessation of all operative work in the region of the antrum once this cavity has been opened, with the exception, however, of the gentlest curetment to remove granulation tissue. Particularly should one avoid the floor and inner wall of the aditus, and the upper and deep portion of the partition separating the artificial excavation from the bony canal.

It must be emphasized that this description of the simple operation and of the precautions to be observed during its performance applies only to adults, and that a very different state of affairs, lying, unfortunately, outside the limits of this paper, obtains in the case of children.

Operation under the last six indications given, calls for what is known as the radical operation, a term rather varying and indefinite in its exact scope and meaning. Since it is contended that it should never be performed by one who does not possess special skill and training, it would be out of place to describe

it here, and it will suffice to state that it calls for the removal of all necrotic or diseased tissue, not only from the mastoid apophysis, but also from the mastoid antrum, aditus ad antrum, tympanic attic and middle ear, including the drumhead and ossicles or remnants of these structures. Its most modern development includes the conversion of the whole region described into a continuous cavity to be lined eventually by a proliferative prolongation of the epithelium of the external auditory canal.

## THE YEASTS OF THE HUMAN STOMACH.

BY

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Yeast is found in the human stomach whenever there is some free hydrochloric acid present. In hyperchlorhydria accompanied with alimentary stasis, the yeast is greatly increased in quantity, and fungi may be present also. The latter are under such conditions usually nothing else than mycelia or outgrowths of the yeast, and not separate species; for as will be seen yeast in cultures gives rise frequently to mycelia or fungi.

In addition to the foregoing, there is often found in the human stomach, under the conditions mentioned, a small bacillus which I have described elsewhere \* under the name of *Bacillus chlorhydrici*. The physiologicicochemical actions of the latter are similar to those of the yeast and the description of them given in connection with the latter also applies to those of the former.

It may not be unprofitable to describe here the cultural peculiarities, the morphology and the actions of the yeast of the human stomach, as it seems that it has not been done before by other investigators.

The yeast found in the human stomach is of the *Saccharomyces cerevisiæ* variety. Occasionally the *Torula rosacea* is also obtained in cultures, but it is not frequent, and can therefore be neglected. The morphology of the yeast in a hanging drop of gastric juice is hard to describe with accuracy, because fat globules may resemble yeast cells, and they are frequently mistaken for one another by inexperienced observers. It is best to make

a smear preparation of the gastric juice on a cover-glass, fix it and stain it according to the Gram method. Yeast takes the Gram stain well; fat globules, of course, do not. The size of the yeast cells differs in various stomachs and also in the same stomach. In the same stomach there are bigger and smaller individuals. Some of them appear in pairs, showing a mother and a daughter cell, and others appear in groups. Their size usually varies from a big coccus to that of the half of a normal red blood-corpuscle. Sometimes they may be of the size of a red blood-corpuscle; but frequently they are smaller. The yeast cells in the stomach are as a rule smaller than the yeast sold on the market for baking purposes.

In cultures, the yeast cells undergo an involution. Their size is more uniform in the ordinary culture media, but are on the whole smaller, and under the microscope they appear like big cocci. Their size is usually from two to three microns. They are round and do not appear to have a nucleus.

*Cultural Peculiarities.*—Yeast can be obtained in the ordinary culture media from the gastric juice. It grows best in a medium containing some HCl, but it grows also in the ordinary neutral culture media. Colonies appear in about 12 hours. The optimum temperature is that of the normal body; but it grows also, though much slower, at the ordinary room temperature. The colonies in cultures differ according to the gastric juice. On nutrient agar in Petri dishes in about 24 hours, the colonies attain the size of ordinary pinheads; their borders are regular and they have a hyaline appearance. Some gastric juice yields in cultures big waxy colonies which confluence and form a waxy pellicle. Another gastric juice may yield light, moist colonies. Under the microscope all these colonies have a similar appearance; they are round, with regular borders, and are dark brown, the center being darker than the periphery. On agar slant by smear the colonies usually confluence and cover the whole surface along the striæ, except at the upper part where isolated colonies grow. They grow in a similar way on gelatin, which in most cases

is not liquefied. But some gastric juice yields yeast which does liquefy gelatin in 48 hours. It grows very slowly on blood-serum. Milk as a rule is not coagulated. It does not cause cracks in glucosed agar stab cultures.

On leaving the cultures for a week or so it will be seen that in some spots, the colonies have covered themselves with light, round tufts of fine threads radiating from the center. Under the microscope the threads or mycelia appear to emanate from the colonies; they present an intricate mesh-work in the center, and at the periphery they appear like the naked branches of a bush in winter. The moist colonies of the yeast referred to, obtained from some gastric juices, usually do not yield mycelia.

We shall now consider the effect of the yeast on the several foodstuffs.

*Albuminoids.*—I take four test-tubes and put into each one a small cubic piece of lean cooked meat, of equal size, and 10 cc. of a 0.2 percent solution of [HCl. To test-tube 2 I add a few platinum wire loopfuls of yeast obtained from a human stomach. To test-tube 3 add yeast and some pepsin, and to test-tube 4, pepsin without yeast. I put away the four test-tubes in the incubator at blood temperature and examine them about 16 hours later, shaking them up now and then in the interval.

I will first consider test-tubes No. 1 and No. 2. The former, it will be remembered, contains meat and a solution of HCl only, and the latter had also some yeast added to it. On comparing the two, it can be seen macroscopically that digestion has more advanced in the latter. In the former the fibers simply swelled up, and by shaking were partly broken up; but in the latter the fibers are more disintegrated and there is a considerable precipitate at the bottom of the tube. There is also some change in color, being slightly grayish-white in test-tube No. 2, but there being no change in color in tube No. 1.

On filtering part of the contents of test-tube No. 2 and heating part of the filtrate till boiling, no coagulation takes place even if some acetic acid and some weak solution of salt had been

added. On applying to part of the filtrate the tests for albumoses, according to Salkowski,<sup>2</sup> their presence can be easily detected. On precipitating part of the filtrate with ammonium sulfate, filtering it off and testing the filtrate for peptone, the presence of the latter can also be detected. The biuret reaction of peptone however is not net; frequently there is a purple color, but a net rose or pink color cannot be obtained. A net rose color can be obtained only when pepsin had also been added.

On examining test-tubes No. 3 and No. 4 it will be seen that digestion in the former, which, it will be remembered, contains HCl, pepsin and yeast, is more advanced than in the latter to which no yeast was added. On examining microscopically part of the precipitate of tubes No. 3 and No. 4, it will be seen that the latter contains numerous undigested muscular fibers, but the former contains very few of them and consists of an amorphous mass. Of course, both tubes contain peptone and yield a net biuret reaction.

It must be stated here that some yeast is also developed in test-tube No. 1, to which, it will be remembered, no yeast has been added, because it develops in a medium containing HCl. The *Bacillus chlorhydrici* also develops; but the amount so developed is small. The medium, must contain the necessary nutritive elements for these microorganisms fully to develop.

The effect is similar on egg albumen. The effect of yeast on meat or egg albumen in water without HCl is similar to that of pepsin. Putrefaction is somewhat delayed as compared with a test-tube which contains meat and water alone, and the bacteria seem to be less motile than in the latter.

The contents of test-tube No. 3, mentioned above, can be kept for months without a foul odor being noticed, whereas the contents of test-tube No. 4, soon deteriorate. This is probably due to the fact that in test-tube No. 4, unpeptonized albumin was left, which can easily undergo putrefaction, but none was left in tube No. 3.

*Fats.*—I take three test-tubes and put into each an equal amount of a 0.2 percent solution of HCl and a piece of boiled meat with some

fat attached to it. To test-tube No. 2, I add some pepsin, and to tube No. 3, pepsin and some yeast obtained from the human stomach. I put away the three test-tubes at the blood temperature and examine them 16 or 20 hours later, having in the interval now and then shaken them up. The contents of test-tube No. 1, which contains fat, meat and HCl only, are not changed much. We shall not consider the changes in the proteid matter in test-tubes No. 2 and No. 3, as this has been done before; but we shall see how the fat is affected.

In tube No. 2, the fat in small lumps floats on the surface of the fluid or is to some extent adherent to the walls of the tube. There is evidently not much change in the fat. In tube No. 3, the fat appears on the surface as a creamy layer, and on shaking the test-tube, it mixes with the contents, and it requires some time till some fat appears again on the surface. Not so in tube No. 2; the lumps of fat do not mix with the contents of the tube, but can be easily fished out. Now, in applying the tests for fatty acids to the fat of tubes No. 2 and No. 3, it can be easily seen that in the latter much of the fat, if not all, has been transformed into fatty acids, which become saponified when treated with half-saturated solutions of sodium carbonate, and also with sodium hydrate at the room temperature.<sup>3</sup> In tube No. 2, very little of the fat has been transferred into fatty acids.

*Carbohydrates.*—The effect of yeast, *i. e.*, *Saccharomyces cerevisiæ* on raw vegetable substances containing starch has been more or less discussed by authors, though I have been unable to find any detailed account of it, and to learn what are the exact chemical changes in flour for instance, that has undergone fermentation by the addition of yeast. Laumanier<sup>4</sup> calls it a process of hydration, but does not say what are the chemical changes. So far as my experiments go, I could not detect any glucose in the dough of wheat flour. On examining a sample of wheat flour I found it to contain starch, but no glucose. On making a solution of such flour and adding to it a solution of potassium hydrate or sodium hydrate a jelly-like mass was formed, which did

not show the presence of glucose by the usual methods of examination. By adding yeast and water to the flour and allowing it to ferment for about 20 hours, and examining it then, no glucose could be detected either. The yeast of commerce contains numerous bacteria beside the yeast proper, and by developing in the dough bring about the development of lactic acid,<sup>5</sup> but glucose is not formed.

Now I take three test-tubes, fill each with a solution of the same wheat flour which did not yield any glucose reaction and submit them to boiling in a water-bath for a sufficiently long time to make the contents sterile. After they have thus boiled and at the same time been made sterile, I add to tube No. 1, a few platinum wire loopfuls of a pure culture of yeast from the stomach, and to tube No. 2, I add some yeast of commerce, and tube No. 3, I keep as a control. I put away the three tubes at a temperature of 38° C. and examine them in 16 or 20 hours. Tubes No. 1 and No. 2, yield a glucose reaction; but tube No. 3, does not. Yeast then transforms boiled starch into sugar, *i. e.*, glucose, but it has apparently no such effect on raw starch.

The experiment was made with flour and not with pure starch, because yeast would not grow in a medium of pure starch or of pure fat, as it needs proteids for its growth.

From what has been described, it is evident that yeast has an action on the several food-stuffs. *Bacillus chlorhydrici* produces effects similar to yeast. From the foregoing it is evident that microorganisms do help digestion in the human stomach, but to what an extent they do it in the normal stomach is hard to say. It can, furthermore, be seen that fat and starch are to some extent being acted upon also in the stomach.

In examining stomach contents, there are always organic acids present in addition to HCl. In cases of alimentary stasis due to obstruction of the pylorus in conditions accompanied with the presence of HCl, the total acidity of the gastric juice as titrated by a decinormal solution of sodium hydrate may reach 110, whereas the hydrochloric acid acidity may amount only to 60; thus leaving an acidity of

50 for organic acids. Now the amount of lactic acid under such a condition is insignificant; the organic acidity is then mostly due to the fatty acids. Yeast and *Bacillus chlorhydrici* are found in great abundance in such conditions of the stomach. Glucose is also abundant in the stomach after a meal of carbohydrates more than can be attributed to the action of the saliva. According to Ranke<sup>6</sup> cane sugar is transformed into glucose in the stomach by mucous secretion.

From the foregoing it can be seen that the stomach is not a mere reservoir, as some are inclined to think in view of the recent few facts that a few individuals whose stomachs had been removed survived for some time afterwards. It is possible, indeed, to keep up life by rectal feeding, but such a life does not amount to much.

What has been said concerning the bacteria of the human stomach does not necessarily apply to the stomachs of animals. In the stomachs of mice and rats, for instance, I found diplococci and bacilli of the *B. coli communis* group, which, as said before, are not found in the normal human stomach. The HCl in the stomachs of these rodents seemed to be very deficient, as no reaction whatever was produced on Congo paper. No yeast was found.

As was said before, in some conditions of the stomach the yeast is greatly increased in quantity. Whether or not it is able to cause gastritis is hard to determine. Elsewhere<sup>7</sup> I have stated that yeast and *Bacillus chlorhydrici* when rubbed into the root of a tail of a white mouse caused a round nonsuppurating ulcer. It is the same with yeast as with the HCl in the stomach. In physiologic quantities it is useful for digestion; in abnormal quantities it may be hurtful. The same can be said of *B. chlorhydrici*.

The foregoing studies may pave the way for the solution of a very practical and important problem—namely, the preservatives in food. Since it is proved that certain microorganisms help digestion, such preservatives or antiseptics, therefore, which in the quantities used hinder their growth, are harmful. This can be

easily determined by experiments *in vitro* and *in vivo*.

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- <sup>4</sup> Dr. J. Laumanier: *La Physiologie Generale*, pp. 64-78.
- <sup>5</sup> *American Medicine*, An Experimental Study of Lactic Acid Formation, Jan. 1, 1905, by E. Palier.
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### EXOPHTHALMIC GOITER FOLLOWING CURETMENT.

BY

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Interesting cases should be reported; rare ones likewise; and when both conditions are associated in one individual there is that much additional reason for its being put on record. It is with one of these cases that this paper deals together with a dissertation upon the subject, limited, however, by inability to search the literature for thorough study. This mite is merely presented to add to the sum total of the knowledge upon the subject, and aid some other more fortunately situated individual in a more elaborate study of the subject.

Mrs. M. S., aged about 30, first came to my notice in August of 1902, three months after having buried a 3½ year old boy who had been fatally scalded, dying within 24 hours. She was suffering from the shock natural from so harrowing an accident. Her main complaints of insomnia and headache were relieved by potassium bromid and nux vomica separately administered.

She was pregnant at this time, and there soon developed a pronounced urticaria of a peculiar kind, with intense itching, accompanied by symptoms of indigestion, and subsequently followed by hip and thigh pains, abdominal cramps, and sacral ache associated with constipation.

In January, 1903, she had an attack of grip, which confined her to bed for several days. Recovery was slow. On March 2, she was prematurely taken with labor pains, resulting in the expulsion of a seven-months' fetus, probably two months dead judging by its develop-

ment and condition of maceration. The placenta was small, and degenerated almost throughout its entire extent. She informed me that she had felt no "life" after her attack of grip.

After the puerperium she had an attack of thigh pain, as well as pain in the left inguinal region. To this was to be added the suffering from an eroded os, a chronic endometritis, and excessive menstrual flow, both in quantity and duration. This condition slightly improved by the end of April, when she again had intense itching of the face with recurring deep-seated rash. Constipation began to trouble her in May, while toward the end of the month there was pain in the left ovary that would come and go. Beside the itching, the facial rash, by the end of May, was accompanied by a dry, drawing sensation of the skin, and red blotches followed by exfoliation. Constipation became obstinate and persistent, and indigestion very marked.

In the early part of August a coryza relieved the monotony of her several distresses. On August 11 she was suddenly taken with severe abdominal pain, nausea, and diarrhea—probably an acute indigestion from which she recovered within 12 days. On August 26 she had severe cramps in the upper abdomen, with chills and sweating. The cramps remained with her faithfully for weeks, and she was troubled with frequent micturition.

Early in October the menses were a little delayed, and she flattered herself that she was again pregnant, in which hope, however, she was disappointed. On October 14 she passed a lumbricoid worm and a few days later mental dejection became evident. As all her symptoms seemed fairly attributable to a bad endometrium, curetment was advised on October 15. By November 17 she had become quite pallid from malnutrition, worry, brooding, and loss of blood, and on this day, Dr. Joseph I. Smith put her under ether, while I thoroughly scraped the uterine cavity. On the following morning her temperature was 101.4°, but promptly dropped to normal, fluctuating thereafter between that and 98° for 10 or 12 days. Her uterus was packed with iodoform gauze at the time of operation, and daily thereafter for 10 days. After leaving her bed at the end of 12 days, she was much improved, though her indigestion and constipation continued.

By January 14, 1904, she tended again to slightly excessive flow in addition to her other symptoms, with a little leukorrhea and a moder-

ate retroversion, for which latter condition a Smith pessary was placed five days later. Everything she would put into her stomach promptly caused severe epigastric pain, and her abdomen was always sore. On January 30 she appeared to have another attack of grip, with a history of having had a "cold" for a week, back was sore and tender, with similar pain in the front of the trunk, and brow ache. She was very nervous, shaky, and fidgety; at times feverish. Her pulse was 132 and thready. From this time on her quick pulse did not leave her, 112 being the lowest recorded. Morning headache developed, also attacks of hiccough and stiff neck. By February 11 she noticed occasional throbbing of her neck, and on March 1 she noticed enlargement of her thyroid. At this time she also had well-marked dyspnea, she was losing weight, there was general tremor, she had a systolic hemic murmur, as well as a marked precordial thumping of the heart, with exceptional restlessness. Her manner was excitable and her speech was hurried and rapid as in belladonna poisoning. General pruritus returned.

On March 15 I was called to see her, and found a remarkable loss of weight. From having been very plump, she was thin, shrunken, with drawn features, and physically almost helpless, being so weak in both legs that she was unable to get into a car or go upstairs unassisted. She was still very nervous. At this time, because of her general emaciation, I readily detected a looseness of her right kidney. She was seen by Dr. Boardman Reed, who found apesias and anhydria. Upon his advice both lower extremities were massaged and I applied to them static sparks, and galvanized the pneumogastrics. But all without avail. Her speech had become thick and jerky. The right thyroid was more enlarged than the left, and very hard. Insomnia continued. The static positive breeze to the lower extremities seemed to help her, as did also galvanism between the nape of the neck and the epigastrium, though improvement was exceedingly slow. Her legs were still extremely unreliable by the end of March. Her pulse all along continued at from 120 to 130 while resting quietly.

At this time she began the use of 0.65 gm. (10 gr.) of potassium bromid four times daily, and as nearly absolute rest as possible, consistent with partial attention to her household duties. A few days later her goiter was noticeably smaller and softer on arising than it had been when she retired. Her legs were better, though her walk was still very clumsy. The

potassium bromid was continued while her condition gradually improved. By the end of April she again began to vomit, preceded by nausea which left her immediately after emptying her stomach. By May 2 her menses were somewhat behind time, locomotion was improved, her pulse still remained at 120 and very small. The nausea had disappeared. Her last regular menstruation occurred on March 4, 1904, with a slight show on March 27 and 28. On May 13 she complained of poor vision, swelling and drawing of the eyelids, pulse 125 and small, and return of dyspnea, the cervix uteri was very soft, and there were occasional twinges of breast pain. The leg veins were enlarging. Both legs were still deficient in power with increased stiffness. A four and one-half days' stay at Atlantic City had proved very beneficial so far as amelioration of symptoms was concerned. She slept well, and awoke refreshed, but with a slight headache on arising, which had been a sign of her former pregnancies. Her eyes continued to trouble her considerably, which they had also done in her two former gestations.

By May 20 her legs felt normal. Three days later there was reenlargement of the thyroid on the right side, with increased hardness and distention of the superior thyroid veins. The pain extended up from it to the ear and the angle of the jaw. Within a few days she began to develop general stiffness and soreness of her muscles. By June 9 there were still no menses, but there was slight dyspnea with pulse at 130, and increased enlargement and firmness of the thyroid. Her potassium bromid was increased to 2.6 gm. (40 gr.) every day, and more if needed. Four days later there was a slight menstrual flow, and she complained of backache. The flow lasted but two days, and was very pale.

Beginning June 16, she was given 1 gm. (15 gr.) of sodium salicylate three times daily, with essence of pepsin, while the bromid was also continued. There was prompt and noticeable improvement in the softening of the thyroid, diminution in size, lessened palpitation, fall of the pulse to 112 with improved quality, increase in weight, and a general sense of well-being, so that on June 25 she described herself as feeling "grand." On this date she had a slight bloody vaginal flow, and she complained of rather profuse perspiration. Oil of gaultheria in 10-drop doses thrice daily was added to her other medicinal treatment, with resulting continued improvement in her symptoms.

By July 25 her pulse was good in quality

and varied from 98 to 104. By August 5 the left thyroid was normal, and the right was nearly so in appearance and size. A week later she again had a slight bloody show with backache, pulse 96 and good. Uterus was sensitive to axial pressure. On August 18 she felt as if her menses wanted to come but could not. The thyroid was much smaller, pulse was 86, small, and rather excitable. On September 1 she considered her menses three weeks overdue, supposing the other appearances of blood as regular menstruations.

She complained of faintness and looked pallid on August 14. By October 25 she felt "dead" in both thighs, with a dull pain in them and in her back. There had been no signs of menses since July 12, 1904. Much gaping and yawning at night. Occasional severe breast pains. No whites. She was costive and had frequent micturition and occasional nausea. Breast areola shows enlarged papilla, swelled, and vaginal mucosa a dusky red. Os very soft. Uterus was enlarged, but so soft that it could not be readily outlined through the fat abdominal wall and a corset which it was too inconvenient for her to remove. By November 10 the goiter was improved again, and she was undoubtedly pregnant. On November 23 she began to notice fetal movements. She looked and felt well except for some pain in the back of the right hip and down the leg.

From this time on she had no very severe discomfort other than the mental worry that her child might again die in utero, as its movements were sometimes very feeble.

She was taken with labor pains early in the evening of April 17, 1905, and I saw her for the first time near 10 p.m., remaining with her during the night. She had dry and intermittent labor pains, mostly inefficient. At 10:30 a.m. I applied the forceps, and delivered a living male child as quickly as was consistent with safety to the mother's soft parts, which were only slightly torn, and required but a single stitch. Her recovery was uneventful, and she and her child are in first-class health at the present time (February, 1906).<sup>1</sup>

The interest attaching to this case consists in a previously healthy woman developing exophthalmic goiter of a pronounced type after uterine curetment, responding indiffer-

<sup>1</sup>Now, a year later the child and mother continue well, and she gave birth to another boy on November 9, 1906, also well.

ently to treatment until potassium bromid was used, with a view to allaying irritability of the nervous system. Noticing the mention of Dr. Chaddock's paper in the *Journal American Medical Association* early in 1904, relative to the prompt remission of symptoms in a case of exophthalmic goiter seen by him with Professor Bobinski, upon the use of 1 gm. (15 gr.) of sodium salicylate thrice daily, together with two similar ones, I used this upon my patient and with somewhat gratifying results. But the main point of interest lies in the fact that her improvement became progressive after impregnation, culminating in what it is fair to consider an absolute cure, even before the birth of her child.

Wells<sup>1</sup> reports a case of exophthalmic goiter following curetment, which promptly succeeded the operation, but did not continue active beyond the twenty-fourth day, after which the patient gradually improved. The treatment was symptomatic. She was 53 years of age, and had had right thyroid enlargement with excitability, rapid pulse, and slight tremor for years, though without exophthalmos. In this case the operation seems to have lighted up slumbering conditions, while in mine there was no preexisting sign of similar trouble.

In these days of belief in the infectious origin of almost all diseases, the question arises whether or not the operative procedure may have introduced into the uterus and circulation a morbid element or germ, or whether it may not have developed an internal poison in some way with which we are not yet familiar.

Dr. Sajous' seductive theory of thyroid stimulation and its effect upon the adrenal system, so-called, has some exemplification in this case, which is referred to him for analysis in consonance with his theory.

Tyson voices the general sentiment in saying that "any sudden mental shock, worry and grief, and physical fatigue" are the usual causes of exophthalmic goiter.

Because of its, at least suspected, emotional origin, it is, as would *a priori* be surmised,

<sup>1</sup> Medical News, June 25, 1904.

more common in women than in men, the proportion ranging, according to various authorities, from 1 to 7 to from 1 to 70.

Strumpel says, "Many authorities have laid considerable weight on diseases of the female sexual organs, but the importance of this factor seems to us to have been exaggerated. It is certain, however, that the first symptoms of exophthalmic goiter often develop at the period of pregnancy." This is peculiarly interesting in view of the fact that in the case reported the patient got well during pregnancy.

## A STUDY OF THE BLOOD IN SYPHILIS.

BY

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As an introduction to my own observed results, it was thought to be of value to summarize briefly the more important conclusions of recent writers concerning the characteristics of the blood in the various stages of syphilis. The material for this review and the literature referred to were obtained mostly from Limbeck, "Grundriss einer Klin. Path. des Blutes," 1896, from Growitz, "Klin. Path. des Blutes," 1902, and from the books by Cabot, Ewing, Da-Costa, and others.

### ERYTHROCYTES.

*Primary State.*—Stoukovenkoff believed that no change occurred in the erythrocytes in the first four to seven weeks and that any variation noted was due to other causes. Hayem agrees with this and mentions the fever as one such auxiliary cause. Biegnaski observed distinct polycythemia in the early stage and Oppenheim and Löwenbach could determine no decrease in 34 cases.

*Secondary State.*—Many investigators assert that the erythrocytes begin to lessen in number with the outbreak of the secondary symptoms, a condition similar to the anemia of chlorosis—syphilitic chlorosis. Konried observed a fall to 2,000,000 or less in untreated subjects

and Wilbouchewitz, in ten patients, noticed a daily decrease of 229,000, with a reduction of the hemoglobin to 55 percent—25 percent, especially in women. Reiss found the red cells decreased especially at the appearance of the eruption and Stoukovenkoff reported a similar condition. On the other hand, Lezius failed to discover any such reduction at the eruptive period.

*Tertiary State.*—In untreated patients the anemia is probably pernicious in type in the third stage with normoblasts and megaloblasts. It is especially in infants that syphilis induces the severe kind. Treating the patients, limits the impoverishment of the blood so that only a moderate grade of anemia is observed. Konried determined the average number of red cells to be 4,000,000. Ewing has found different grades of chlorotic and pernicious anemias in cases showing advanced tertiary lesions. Müller found syphilitic pernicious anemia in four cases, one representing 720,000 reds, and Loach reports a similar instance.

#### HEMOGLOBIN.

*Primary Stage.*—The percentage of hemoglobin is usually lower than normal in the first period. Konried found such a condition four to seven weeks after infection. The decrease is gradual, and at the onset of the secondary stage the loss is from 15 percent to 30 percent.

*Secondary Stage.*—In some cases the hemoglobin is as low as 55 percent—25 percent for a few weeks or months. Reiss and Stoukovenkoff found a distinct decrease at the beginning of the eruption.

*Tertiary Stage.*—In 22 cases with gummas, Konried reported 50 percent—80 percent of hemoglobin.

#### LEUKOCYTES.

The leukocytosis of syphilis is related to the eruption and to the anemia.

*Primary Stage.*—Rille states that no change is observed in the leukocytes in this period. Jelleneff has found a case of anemia with leukocytosis. Konried has reported an instance of slight leukocytosis in the first week, the differential count showing an increase in the lympho-

cytes and a decrease in the polynuclears, but the administration of mercury reversed this variation.

*Secondary Stage.*—With an eruption and adenitis there is usually leukocytosis with fewer polynuclears and increased lymphocytes. Jelleneff teaches that in the exanthematous period with lymphatic enlargement, the whites are decreased by treatment. Rille and Zappert have seen eosinophilia, though Peter believes this pathologic variation to be due to other causes. Myelocytes have been observed by Rille, and Engel and Brown have noticed an augmentation of the polynuclears in cases with bad prognosis. Mercury and potassium iodid improve the blood condition.

*Tertiary Stage.*—Leukocytosis has been seen by Konried, and with gummas this change, and especially lymphocytosis, are found. The presence of occasional myelocytes is not uncommon.

#### BLOOD-PLATELETS.

In the presence of syphilitic anemia the platelets are increased. Losdorfer has asserted that bodies similar in appearance are frequently discovered in syphilis. The Justus test, which has been heralded as a diagnostic aid in syphilis, has shown itself to be unreliable, though Justus has recently urged its value.

Acting upon the suggestion of Dr. F. R. Zeit, professor of pathology at the Northwestern University Medical School, I have made a series of observations on the blood in syphilis. The subjects were from Dr. Baum's clinic at the Post-Graduate Medical School and from the Dispensary of the Northwestern University Medical School. Blood counts were made with the Thoma-Zeiss apparatus. In estimating the percentages of the various leukocytes 1,000 cells were counted. Hemoglobin was determined with the von Fleischl instrument. Smears were stained by Wright's stain to which had been added an equal volume of methyl alcohol. The findings in nine cases which were in the primary stage are here tabulated:

The following facts concerning the erythrocytes can be deduced from this compilation. In eight male cases the average number was

TABLE I.

No. of Case.	Race.	Age.	Sex.	R. B. C.	W. B. C.	% Hb.	Percentage of Leukocytes Counting 1,000.						Blood-plates.	Red Cells.	Characteristic of Disease.	Treatment.
							Small lymph.	Large mono.	Neut.	Eosin.	Mast.	Myel.				
3	C	28	M	5,000,000	4,000	94	48	14	36	1	1	...	.....	.....	Ulcer, Chancr.	Treated.
6	C	36	M	4,000,000	10,400	82	18	2	80	0.2	0.1	...	.....	.....	Ulcer, Chancr.	Treated.
15	W	16	F	3,500,000	7,000	75	18	9	68	3	1	...	.....	A few microcytes.	Bubo syphilis (?).	Treated.
19	W	22	M	4,100,000	8,800	71	18	4	74	3	1	...	Slightly increased.	.....	Ulcer, Chancr.	Treated.
32	W	23	M	5,000,000	8,000	95	33	3.5	61	2	0.5	...	.....	.....	Ulcer, Chancr.	Untreated.
33	W	22	M	4,500,000	8,000	95	23	1.5	75	0.7	...	...	.....	.....	Ulcer, Chancr.	Treated.
38	W	39	M	5,500,000	7,500	95	19	7	73	1	0.2	...	.....	A few microcytes.	Ulcer, Chancr.	Untreated.
44	W	29	M	4,300,000	7,800	70	20	9	62	1	...	...	.....	.....	Ulcer, Chancr.	Treated.
48	W	30	M	4,100,000	11,000	70	15	8	73	0.7	0.5	...	.....	.....	Chancr of lips.	Untreated.

4,561,000. In three untreated patients it was 4,800,000. Case No. 38 shows a relatively high count which was controlled by a subsequent observation. Patient No. 15 was only a suspected case. In the fresh preparations, for the most part, the red cells were normal in shape and form. In Case No. 19 there was noticed an increase in the central area, indicating a diminution of hemoglobin, while Nos. 15 and 38 showed a few microcytes. No changes of note were demonstrable in the stained specimens.

The majority in this stage showed a slightly decreased percentage of hemoglobin, 70 percent-95 percent, and while a low color index obtains as a rule, two cases were exceptions, giving indexes of 1.25 and 1.07.

In the total number of nine patients, the white cell count was increased three times, normal five times, and decreased once. The differential estimations<sup>1</sup> gave results as follows: The small lymphocytes were increased twice,

decreased once, and were normal in six cases. The large mononuclears were increased in one, normal in four, and decreased in four cases. Among the large mononuclear leukocytes, large lymphocytes and transitionals was 6.5:2:1.5. The polynuclears were increased in number in five patients, normal in three and decreased in one. No increase in eosinophiles was noted, eight cases showing a normal condition and one diminution. In two cases mast cells could not be discovered; in the seven others they were noted.

In stained specimens a few fine neutrophilic granules were found in the cytoplasm of the small lymphocytes. Some of these were likewise observed in the large mononuclears. In one case some delicate reddish granules were seen in the perinuclear protoplasm of the large mononuclears. Some of the latter structures were also evident in a few of the polynuclear neutrophils, which had several forms of nuclei, some subdivided into 2-6 parts, others showing Z or S forms. Associated with the coarse eosinophilic granules, some fine neutrophilic ones were found. Most of the eosinophiles showed nuclei divided into two parts, although as many as four were seen. Here and there among the coarse basic granules of the mast

<sup>1</sup>The normal differential count was taken as follows:

Lymphocytes	25%
Large mononuclear and transitional.	5%-8%
Polynuclear neutrophils	60%-70%
Eosinophiles	2%-4%
Mast cells	3%
Myelocytes	Absent.

cells a few reddish and neutrophilic ones were detected. No other features of note were observed.

The findings for the patients in the secondary period are given in the following table:

TABLE II.

No. of Case.	Race.	Age.	Sex.	R. B. C.	W. B. C.	Hb.	Percentages of Leukocytes Counting 1,000.						Blood-plates.	Red Cells.	Characteristic of Disease.	Treatment.
							Small lymph.	Large mono.	Neut.	Eosin.	Mast.	Myel.				
2	W	20	M	3,500,000	5,400	83	33	5	61	1	...	...	Increased.	.....	.....	Treated.
4	W	32	M	5,700,000	8,000	82	16	10	68	4	2	...	Increased.	.....	.....	Treated.
5	W	22	M	3,500,000	6,600	90	20	5	67	10	1	...	.....	.....	.....	Treated.
7	W	33	M	5,000,000	6,200	83	30	10	67	2	1	...	.....	.....	.....	Treated.
9	W	32	M	4,500,000	4,800	84	20	12	65	2	1	...	Increased.	A few microcytes.	.....	Treated.
10	W	28	M	4,300,000	4,800	82	25	9	53	9	1.5	...	.....	.....	.....	Treated.
11	W	24	F	3,500,000	10,000	...	22	14	63	1	...	...	.....	.....	.....	Treated.
13	W	21	F	4,500,000	9,000	80	14	11	75	.....	...	...	.....	.....	.....	Treated.
14	W	34	F	4,200,000	7,000	85	13	6	79	1.5	...	...	.....	A few microcytes.	.....	Untreated.
16	W	18	F	4,200,000	6,600	76	25	11	61	.....	2	...	.....	.....	.....	Treated.
18	W	27	M	4,000,000	5,300	80	19	10	70	1	...	...	.....	.....	.....	Treated.
21	W	20	M	5,000,000	9,200	90	15	10	72	2	...	...	.....	.....	.....	Treated.
22	C	26	F	2,500,000	7,000	51	14	6	71	8	0.7	...	.....	.....	.....	Untreated.
24	W	43	F	4,500,000	5,000	80	13	2	84	.....	1	...	.....	Generally small normocytes.	.....	Treated.
25	C	23	F	4,400,000	5,000	80	40	17	43	.....	...	...	Increased.	.....	.....	Untreated.
27	W	22	M	4,500,000	8,000	60	17	10	70	1	1	0.1	.....	A few microcytes.	.....	Untreated.
28	W	30	F	4,000,000	5,200	70	35	5	56	2	0.7	...	.....	.....	.....	Treated.
29	W	20	M	5,000,000	6,000	95	25	9	63	2.5	...	...	.....	.....	.....	Untreated.
30	W	24	M	4,700,000	6,200	85	31	11	56	2	...	...	.....	.....	.....	Untreated.
31	W	27	M	4,800,000	10,400	85	25	5	69	1	...	...	.....	.....	.....	Untreated.
34	W	21	M	4,700,000	5,000	85	24	4	71	1	...	...	.....	.....	.....	Treated.
36	W	16	M	3,000,000	8,000	80	38	4	56	1	1	...	.....	.....	.....	Untreated.
39	W	24	M	4,700,000	8,600	75	49	11	40	.....	...	...	.....	A few microcytes and degenerated cells.	.....	Untreated.
41	W	31	M	4,500,000	10,600	80	12	8	76	3	0.3	...	.....	.....	.....	Treated.
42	W	22	M	5,000,000	6,000	90	38	8	53	1	0.4	0.2	.....	.....	.....	Treated.
45	W	21	M	4,100,000	5,400	80	34	14	48	1	0.3	...	Increased.	.....	.....	Untreated.
49	W	...	F	4,100,000	8,600	80	29	15	53	0.7	1	...	.....	A few microcytes.	.....	Treated.
50	W	...	F	3,700,000	6,700	55	26	7	65	0.3	0.7	...	.....	A few microcytes.	.....	Untreated.

In 18 male patients the average count of the red blood-corpuscles was 4,447,000, with maximum and minimum of 5,700,000 and 3,000,000, respectively, and in ten females the average was 3,960,000, and high and low counts of 4,500,000 and 2,500,000. In seven untreated males the average was 4,200,000, and in four females without medication the mean was 3,700,000. In Cases 45 and 50 there was a decrease in the number of erythrocytes in the early period of

the eruption, and in No. 39, which was in the latter period of the eruption, they were slightly decreased. In the fresh blood, the shape and form of the red cells were uniform, the central area being large. Microcytes were occasionally

met and also some enlarged normocytes. Stained specimens showed some poikilocytes, and in Case 39, distinct degeneration was noticed, the so-called Grawitz's granular degeneration, after staining by Wright's method.

Nearly all of the hemoglobin estimations gave a low result with an average of 78 percent. Except in seven cases, in which the color indexes were high, 1.03-1.01, this calculation gave from .98-.72.

The total white count in the 28 cases was normal in five, increased in seven, and decreased in 16. The differential estimation of the leukocytes gave an increased number of small lymphocytes in 11 cases, a normal one in 11, and decreased one in six. The large mononuclears were normal in 11, increased in nine, and decreased in eight. The relative number of large lymphocytes, large mononuclear leukocytes and transitionals was 6:2.5:1.5. The polynuclear neutrophils were normal in number in 11 cases, decreased in 10, and increased in seven. Three cases showed an eosinophilia, 8%-10%, eight showed a normal number of these leukocytes, 12 showed a decrease and in six none was found. Mast cells were found in from .3%-2% in 16 cases, and in the remainder they were absent. Two cases showed .1% and .2% of myelocytes, respectively.

In stained specimens the small lymphocytes showed a few fine neutrophilic granules in the majority of cases. In the cytoplasm of the large mononuclears similar structures were observed and also some fine reddish granules. In the polynuclear neutrophils there were

some associated reddish or basic granules in the perinuclear protoplasm and among the coarse eosinophilic granules some fine neutrophilic ones. Interspersed between the fine neutrophilic granules of the myelocytes, there were some delicate reddish ones. The nuclei of the polymorphonuclear neutrophils were in the shape of a Z or an S or were divided into two to six components.

The results of the examination of cases in the tertiary period is condensed in Table III.

These 13 cases show slight variations in the red count. Ten males gave an average of 4,550,000. Only one observation was made on an untreated female. Fresh preparations showed no changes in shape and form except in occasional microcytes. Stained specimens were negative excluding patient 12. In this case some normoblasts were discerned and the fresh blood showed normocytes and microcytes of oval shape.

A decreased percentage of hemoglobin, 62%-95% was obtained. In ten cases the color index ranged from .99-.75; in two it was 1, and in one instance it gave 1.03.

TABLE III.

No. of Case.	Race.	Age.	Sex.	R. B. C.	W. B. C.	% Hb.	Percentages of Leukocytes Counting 1,000.						Blood-plates.	Red Cells.	Characteristic of Disease.	Treatment.
							Small lymph.	Large mono.	Neut.	Eosin.	Mast.	Myel.				
1	W	26	M	4,000,000	6,800	72	18	16	76	0.7	0.2	...	.....	.....	Gumma of Nose.	Untreated.
7	W	33	M	5,000,000	6,200	83	30	10	67	2	0.3	...	.....	.....	10 yrs. with condylomas late.	Untreated.
8	W	41	F	4,500,000	9,000	90	23	4	70	2	.....	0.2	.....	.....	Gumma of Skin.	.....
12	W	55	M	4,200,000	3,200	62	16	2	+ $\Delta$ 40 31	...	+ $\Delta$ 1 0.6	...	.....	A few microcytes.	30 years.	Untreated.
17	W	68	F	4,100,000	7,200	81	30	15	55	0.3	.....	.....	.....	.....	Gummas.	.....
20	W	44	F	3,900,000	6,000	80	24	14	32	0.7	.....	.....	.....	.....	14 years.	Untreated.
23	W	40	M	4,500,000	4,800	80	13	2	84	0.2	.....	...	Increased.	.....	13 years.	Untreated.
26	W	34	M	4,500,000	9,000	90	37	8	55	0.4	.....	...	.....	.....	Gumma of Tongue.	.....
35	W	28	M	4,500,000	4,600	85	15	11	72	0.4	0.5	0.5	.....	.....	Gumma of Legs.	.....
40	W	35	M	4,800,000	9,600	95	20	10	66	1	3	...	.....	.....	Gumma of Tongue.	.....
43	W	30	M	4,500,000	4,200	80	44	7	48	1	.....	...	.....	.....	Dermatitis.	.....
46	C	39	M	5,000,000	6,000	90	34	14	50	1	1	...	Increased.	.....	15 years.	.....
47	W	...	M	4,500,000	7,000	75	21	8	68	3	0.2	0.1	.....	.....	Gumma of Leg.	.....

+ = round;  $\Delta$  = oval.

In the 13 cases, the total estimation of the white cells in three cases gave an increased number, decreased in eight, and normal in two. Differential counts showed an augmentation of the lymphocytes in five cases, a lessened number in one, and a normal condition in seven. The large mononuclears were too numerous in five instances, were decreased in three, and normal in five. Relation of large lymphocytes, large mononuclear leukocytes and transitionals was 6.5:2:1.5. The polynuclears were increased in four cases, decreased in five, and normal in four. In eight patients the eosinophiles were normal, in four they were decreased, one patient showing none, and in no instance were these elements increased in number. Seven cases presented .2%-3% of mast cells, in the remaining six none was noticed. In ten patients no myelocytes were observed, while three gave a percentage of .1-5.

In stained specimens the majority of lymphocytes showed some fine neutrophilic, and occasionally a few delicate reddish granules in the cytoplasm. In the large mononuclears similar neutrophilic structures were observed. In the polynuclears could be seen some fine reddish granules associated with the neutral ones, and among the coarse granules of the eosinophiles there were some that were neutrophilic. In the mast cells some reddish granules were found among the basic. In one case, No. 12, there were some mast cells with nuclei of a distinct round or oval shape, which characteristic was seen among the neutrophiles in the same patient. In the myelocytes a few reddish granules were to be seen with the numerous neutrophilic ones. The same forms of nuclei were observed as in the previous stages though forms more nearly like the normal ones were observed. Fresh preparations of leukocytes in all stages gave no information of note.

#### BLOOD-PLATES AND BLOOD DUST.

A number of blood-plates were counted by Ehrlich's method and the results are given here counting 50 fields. In the primary stage an increase of plates was noted in one case, in the secondary they were augmented in five, and in

the tertiary period two patients exhibited more than usual. In stained specimens the platelets were found in colonies of 20-50, some of the nuclei being reticulated. Sometimes the plates were contained in the erythrocytes. The blood dust, so-called Müller's hemokonia, was found but had no special importance.

#### EFFECT OF MERCURY UPON SYPHILITIC BLOOD.

The Justus test was not tried, but the effect of the administration of mercury to five untreated patients was recorded and tabulated here. No special change was noted.

TABLE IV.

No. of Case.	Before Administration.		After 24 hours.		Stage.
	R. B. C.	% Hb.	R. B. C.	% Hb.	
1	4,200,000	85	4,500,000	85	S
2	5,000,000	95	4,800,000	92	S
3	4,700,000	85	4,900,000	90	S
4	4,500,000	80	4,500,000	80	T
5	3,000,000	80	3,500,000	75	S

Dr. W. H. Buhlig, instructor in bacteriology in the Northwestern University, has kindly recast this paper for me. To him and to Professor Zeit, who directed the work and furnished the cases studied, my sincerest thanks are due.

#### SUMMARY.

*Erythrocytes.*—A review of the foregoing data shows that in the primary stage there is only occasionally a decrease in the erythrocytes. In the second period the rule is to find a decrease in the reds, especially in severe cases, in which they may run as low as 2,000,000. In perhaps 70 percent of the cases there was also a distinct change in size and form. In the tertiary stage more or less decrease is demonstrable and some change in shape and form.

*Hemoglobin.*—A loss of hemoglobin is observed in all three stages of syphilis with a reduction of color index, notwithstanding the fact that in seven cases in the secondary period, no elevation was computed.

*Leukocytes.*—In the primary stage the total count was unchanged. The lymphocytes were normal or slightly decreased. The polynuclear neutrophiles were increased, the nuclei usually showing Z forms and the eosinophiles as a rule presented nuclei divided into two.

In the second period the total count was usually smaller than normal. Lymphocytes were of the usual number or slightly increased. The polynuclears were of the usual count or slightly under that, and nuclei divided into three or four parts was the rule. Mast cells were more numerous than in the primary stage. Occasional myelocytes presented themselves in some cases. The granulations of the leukocytes showed an increase over those in the primary period. In the third stage the total count was usually lessened. The lymphocytes were normal or slightly decreased. Neutrophils were normal as a rule, and the nuclear forms were relatively normal. Eosinophiles were usually greater in number than usual. Mast cells showed a condition like that of the second stage. Myelocytes were present in relatively greater numbers than in other stages, one case showed basophilic myelocytes. The granulations of each cell presented decided changes over those in other stages.

### CHORIONEPITHELIOMA.

BY

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Chorionepithelioma, or, less correctly, deciduoma malignum, otherwise syncytioma malignum, chorioectodermal epithelioma (Pick, 1904), has been more or less definitely recognized as an entity for about ten years. So early as 1876, R. Maier published in Virchow's Archives, an article with the significant title "Ueber Geschwulstbildung mit dem Bau des Decidua-gewebes." Yet in 1895, F. Marchand speaks of the decidual tumors following normal birth, abortion, hydatiform mole and extrauterine pregnancy as "so-called" and in 1897, C. Gebhard applies the same qualification to the term syncytioma malignum. In 1898, F. Marchand reports two new cases of malignant chorionepithelioma, with no apology for the term, and from this time on, one of the three synonyms first mentioned, is commonly used as a recognized term for a definite concept. Previously to 1896, chorionepithelioma was usually described as a cancer or sarcoma but, in many instances, with apparently full recogni-

tion of its peculiar nature, while subsequently, many writers have retained the older term of mole, or have classified the condition as a cancer or sarcoma, or have discussed it along with teratoma and, doubtless, many cases have been observed or even subjected to operation, and to histologic examination, without a full realization of their significance. During the last three years, medical literature has teemed with reference to this tumor and it is probable that, consciously or unconsciously, the desire to record a rare case has led to diagnoses that are not justified. In some instances, long preserved sections of tumors previously regarded otherwise have been reexamined and shown to be chorionepithelioma.

In logical and approximately, chronologic sequence, the conception of chorionepithelioma has developed along the following lines: 1. That hydatiform mole was something more than an unremoved placental mass. 2. That true tumors might develop in the uterus or at the site of an extrauterine pregnancy. 3. That these tumors were not merely caused by retained products of conception or by the resulting inflammatory reaction, acting as an irritant, but that the essential tumor cell was derived from the decidua. 4. That such tumors could not only extend but give rise to genuine metastases. 5. That similar tumors might arise so long after pregnancy as to show that the process could not be regarded as a slow but direct progress of a condition begun during pregnancy but that there had been a latency of neoplastic cells. 6. That chorionepithelioma could occur as a primary tumor apart from the site of gestation, for instance in virgins and in males. 7. That, while an apparently primary tumor developing in a woman who could even be suspected of having been pregnant, might be explained on the basis of latency and metastasis, its occurrence in a young girl, or, *a fortiori* in a male, could be due only to some form of teratomatous deposit.

Obviously, with this knowledge, some cases previously regarded as metastases after a long period of latency or, *vice versa*, of latency after metastasis, may be considered as teratomatous.

However, Robert T. Frank,<sup>1</sup> in a very complete review of the whole subject, cites, as "the most interesting and most convincing case bearing on this subject," (the hydatiform degeneration of teratomas,) one reported by Pick in 1902. The patient was operated upon for extrauterine pregnancy, in the sac a few chorionic villi were found. A typic dermoid was also removed, as well as a subsidiary dermoid separate from the ectopic sac and the first dermoid, and containing hydatid bodies.

A sharp line may be drawn between chorionepithelioma due directly or by metastasis to decidua cells and those implanted in the embryo and occurring as developments of teratomas, although, in the first place, it must be admitted that the ultimate genealogy is the same and, in the second place, that in most female cases, there will be, for a long time, and perhaps permanently, great practical difficulties in distinguishing between teratomatous degenerations and delayed development after metastasis. We must also, theoretically, admit the possible existence of introduction by experimentation or accidental implantation (see P. Lengemann in O. Lubarsch's *Zur Lehre von der Geschwulsten*, etc., 1899, and Frank's *Bibliography*). As in all subjects that have not been subjected to careful criticism during a considerable period and in considerable series, some modification of the present conception through revision of errors and accumulation of fresh facts not now obvious, must be expected.

It is safe to say that the great majority of all cases of chorionepithelioma are pretty directly due to decidua cells developing in the course of pregnancy. Galabin,<sup>2</sup> in a symposium at the Obstetrical Society of London, June 16, 1903, stated that of 90 recorded cases, 49 were preceded by hydatiform mole. Of Ladinski's<sup>3</sup> 133 collected cases, 40 percent followed mole. W. L. Wallace<sup>4</sup> quotes with approval P. Findley's statistics, viewing the matter in the opposite way, that 16 percent of 200 cases of hydatiform mole were followed by a true malignancy. Such statistics occasion a feeling of surprise that the definite conception of chorionepithelioma is of such recent date.

On the other hand, that moles do not necessarily become malignant is well known. A. Fleischmann<sup>5</sup> mentions a case of chorionepithelioma of the uterus that was treated by the curet, in which normal pregnancy followed, and that had remained without further development for two and three-fourth years. In general, it is difficult to distinguish accurately between benign and malignant tumors, by a scientific definition, or even in the clinical sense, in many instances. Undoubtedly, many moles treated in the ordinary way have been true chorionepitheliomas and would have developed into malignant tumors, if left to themselves. Since the attention of the profession has been directed toward the matter, time has scarcely been afforded for a satisfactory statistic study of this detail.

P. Findley<sup>6</sup> collected 21 cases which were considered primary chorionepithelioma not at the placental site. The distribution was: Vagina 50 percent, uterine muscle, 15 percent, cervix, labium, kidney, brain, each 5 percent (other parts 15 percent). Percentages mean little for so small a series yet it is obvious that 75 percent are significantly near, in an anatomic and nosogenic sense, the placental site. All of these followed pregnancy, some a mole, and some developed immediately or practically so, 60 percent were between 30 and 41 years of age, and all between 20 and 50. All were definitely due to pregnancy. K. Hammerschlag<sup>7</sup> reports five cases of chorionepithelioma, and numerous more or less well-demonstrated cases are reported in the literature of the last two or three years. Most of these illustrate no doubtful point.

Beside the cases illustrating metastasis collected in the larger series mentioned by Frank, the following may be added to the bibliography: Case following tubal pregnancy, with metastases to lungs, liver, abdomen, and pelvis, Hinz;<sup>8</sup> case with metastasis to lung, A. P. Condon;<sup>9</sup> case with appendix adherent to mole and proliferation of decidual cells, with isolated nests in endothelium over appendix, Hirschberg<sup>10</sup> (scarcely metastatic).

Of cases which may be considered, though

somewhat doubtfully, as primary and not directly due to placentation, may be mentioned the following: Hydatiform mole in child of 12½, Bock.<sup>11</sup> Deciduoma malignum 18 months after menopause in woman of 53 who had had 10 children, verification of specimen by pathologic committee of the Obstetric Society of London, F. J. McCann.<sup>12</sup> Chorionepithelioma of bladder with various metastases in virgin of 75, "unique case," W. S. Djewitski.<sup>13</sup> Chorionepithelioma of ovary of virgin, occurring as recurrence after three years, of papillary carcinoma, F. Michel.<sup>14</sup>

Robert T. Frank has collected, including three original cases (and Sternberg's case reported after Frank's paper was written), 23 teratomas of the testicle, in which chorionepitheliomatous degeneration has occurred. One of his own, one of Boestrum's and one of Albrecht's may possibly be considered as having arisen outside the generative glands but the evidence is either doubtful or the reports too vague to allow a conclusion. The best illustration of occurrence outside the reproductive glands, is a case of Ritchie's verified by Teacher (sic. proper noun), in which a dermoid cyst of the mediastinum contained typic chorionepitheliomatous elements, the patient being a man of 24. He would also admit Djewitski's female case in this category although disagreeing with the opinion that it was not a teratoma but an instance of hydatid transformation of other cellular elements.

The modern tendency is to regard any embryonally misplaced structure as a teratoma, however simple and uniform its constituents, although, as a matter of interest, typic teratomas, up to the limit of obvious resemblance to a fetus, dermoid cysts, and various simple cell inclusions may be distinguished. But, as Bonnet has observed, transitions can be traced. Thus, in cases not due to direct or obviously or supposedly metastatic developments from the placenta, chorionepithelioma is to be regarded as, biologically, a twin of the host, and derived from maternal cells.

Little dissent has been made to the dictum that chorionepithelioma is an epiblastic derivative, though Djewitski regarded his case as a

metamorphosis of other cells and Sternberg has regarded the syncytial formations as endothelial.

The subject of chorionepithelioma, whether due to the decidua or to teratologic implantation and subsequent developments, throws an important sidelight on the nature of carcinoma and sarcoma. Indeed, chorionepithelioma is, essentially, an epiblastic carcinoma. While it is conceivable that malignant development from decidua cells occurs only from the subsequent implantation of a "germ," there is no necessity and no tendency to make this claim. Indeed, the ordinary case of chorionepithelioma is an implanted process, derived, it is true from the ovary of the host, and fully explicable on the conception that the cell is the "germ." As a nonteratologic chorionepithelioma is necessarily due to impregnation, it is even conceivable though scarcely more than possible, that pregnancy itself is a factor in the occasional subsequent malignant development. If so, it is possible that the greater frequency of carcinoma in parous women may not be entirely accidental, due to greater average age and mechanical insult, but that pregnancy itself may, in some recondite way, favor the malignant process in general.

The bibliography of chorionepithelioma is now considerable. Robert T. Frank<sup>1</sup> appends 95 references germane to the subject and we have added enough not mentioned by him to bring the number beyond a hundred. There are also numerous individual case reports, some not very well authenticated, and reviews of at least passing interest.

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## BENIGN STENOSIS OF THE PYLORUS AND DUODENUM RESULTING FROM SPASM AND SCAR TISSUE AND FROM ABDOMINAL ADHESIONS.\*

BY

ALBERT BERNHEIM, M. D.,  
of Philadelphia.

The short time allotted for the delivery of a paper will permit me to give but sketchy histories of the cases I wish to present, and of the treatment which I instituted in them, and in cases of similar types.

CASE I.—C. U., aged 52, butcher. Patient came under my observation April 7, 1901. For three years previous he had been failing in health from abdominal disorders. He was constipated, small stools. Appetite was not good. He smoked from 6 to 20 cigars a day; drank as much as 20 glasses of beer a day until Christmas, 1900. Waterbrash in the morning; he had to urinate three times during the night but only a small amount each time. Pain was present in the epigastric region and heaviness and pressure in the epigastrium after meals. Beginning one hour after meals sour and burning eructation occurred and lasted from two to four hours. Headache, frontal and temporal, sometimes occipital. Frequent vomiting of masses of food and abundant liquid during the night or early in the morning. He had not eaten meat for last four weeks and nevertheless had headache. Patient has lost 25 pounds in weight from September to Christmas, 1900. His best weight had been 172 pounds, now 140. Physical examination showed heart and lungs normal, liver and spleen not enlarged. Smooth swelling in the pyloric region; gastric dilatation, pronounced, splash-sound. On April 10 an Ewald-Boas test-meal was given at 1 p. m.; at 2 p. m. removal of contents, 150 c.c.m.; Congo and dimethylamidoazobenzol reaction very pronounced. Starch very little digested. Much mucus. Free HCl 0.27 percent. Total acidity, 95. Examination of the vomited material showed a similar condition, abundant HCl, mucus, sarcinac, and yeast. Frequent examinations of the stomach and of the gastric contents showed always similar results. Diagnosis, gastritis mucosa acida, motor insufficiency of the stomach, stenosis of the pylorus, pyloro-

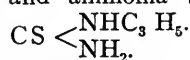
spasm. The treatment consisted of lavage of the stomach, irrigation with solutions silver nitrate alternating with solutions of betanaphtholdisulfate of aluminum, this yielding less effect. After a few weeks of this treatment, together with dietetic and hygienic measures, the patient increased in weight, but still showed pronounced dilatation of the stomach; hyperchlorhydria remained and he still suffered from paroxysms of pain, accompanied by vomiting. Then I instituted a regulated treatment with large doses of olive oil,<sup>1</sup> giving as much as 200 to 250 cc. of best olive oil, either by tube or having the patient drink it three times a day. Under this treatment, he improved excellently. The amount of HCl diminished to normal; the attacks of pain ceased; the bowels moved regularly once or twice every day; there were hardly any remnants left in the stomach on lavage in the morning. The smooth swelling in the pylorus disappeared and on November 13 of the same year the notes in my casebook read:—"Weight 167 pounds. Nothing left one hour after Ewald's test-meal; pain absent; bowels move regularly; patient continues to drink olive oil; feels fine." One year later he weighed 175 pounds and considered himself entirely well. Against my advice he again indulges in beer-drinking and smoking.

CASE II.—D. A., unmarried, aged 32, dress-maker. Came to Philadelphia from the country in September, 1899. Her weight at that time was 135 pounds and she was in good health. In the spring of 1900 she came to the Clinic for Diseases of Stomach and Intestines in the Polyclinic Hospital, then under the late Dr. D. D. Stewart. At that time a diagnosis of gastric ulcer was made. After a few visits the patient felt improved and did not return until a year later, when she complained of symptoms similar to those of the first time. As the ambulant treatment did not seem to have much effect, the patient was advised to enter a hospital. She went there with directions given by me, which, however, were not carried out. She remained in the hospital for two weeks; there was no improvement. She therefore returned to the Polyclinic Dispensary. In January, 1902, she came to my office still complaining of symptoms of pain after eating, so that she ate scarcely anything. Her weight had come down to 100 pounds. Physical examination showed a tall woman, emaciated, pale, muscles flabby, marked tenderness on pressure in the pyloric region and severe pain about one hour after meals. No involuntary vomiting, but the patient induces vomiting to relieve the pain. Vom-

\* Read at the meeting of Medical Society of the State of Pennsylvania, at Scranton, Pa., September 28, 1905.

itus never showed blood, but the stool was constipated, often dark brown and even blackish; she had weak and fainting spells several times and had to stay in bed for a few days. It is worth while to remark that the shape of her body showed a very decided inclination to tight lacing, her outlines being almost like two inverted triangles. Her heart and lungs were normal as to sounds, apex beat a little to the right of the mammillary line.

Abdomen: No adipose tissue, gastroptosis, stomach slightly dilated; all viscera more or less displaced; tenderness in the epigastric and dorsal region; pain more to the left around the pylorus. In the same neighborhood there was a resistance in the shape of an elongated swelling about two inches long by one inch wide. Examination of the stomach contents showed delayed peristalsis and hyperchlorhydria. After excluding a malignant process and after painstaking examination in all respects I made a diagnosis of stenosis of the duodenum following the cicatrization of a chronic ulcer, perhaps even perforating, with following perigastric adhesions. This diagnosis was agreed in by Dr. Stewart. After having advised operation, which was refused, I tried the usual treatment for gastric ulcer, namely, the regular ulcer cure, the use of silver nitrate and betanaphtholdisulfate (alumol) of aluminum, bismuth of nitrate, olive oil and absolute rest cure with exclusion of mouth feeding and application of rectal feeding. These measures had only a temporary beneficial effect. In February, 1904, after reading an article on Pylorus Stenosis by Dr. A. Hartz<sup>2</sup> in the *Deutsche medizinische Wochenschrift*, I put to the patient the ultimatum that I should try some other treatment, but with the proviso that if she were not benefited she would undergo an operation. As the pain was at times insufferable she agreed. Then I instituted, according to Dr. Hartz's treatment, the hypodermic injections of allylsulfocarbamid (thiosinamin). This chemical product is prepared from oil of mustard with absolute alcohol and ammonia water and has the formula of



It will be seen that allylsulfocarbamid (thiosinamin) is a modification of urea, the formula of the latter being  $CO < \begin{matrix} NH_2 \\ NH_2 \end{matrix}$ .

The O in the carboxyl is replaced by S, while one H of the amin is replaced by the radical of the Allyl-series  $C_3H_5$ .

The action of allylsulfocarbamid (thiosinamin) is the setting up of a slow inflammation-

process, whereby a kind of resolution of scar<sup>3</sup> and alien fibrous tissue<sup>4</sup> occurs. It may be compared in this respect to the action of iodine.

After using a solution of the drug in a mixture of water and glycerin, which I found inconvenient on account of the necessity of warming the solution each time, I used as an injection a 10 percent hydroalcoholic solution (60 percent alcohol) and started with 5 minims, equal to one-half grain of allylsulfocarbamid and increased the amount rapidly, as I found that the patient bore the injections well, although occasionally in the beginning they caused a burning sensation lasting from half an hour to two hours. I began on March 29, 1904, and followed it up in the beginning every third or second day, but later injected every day. The improvement was rapid and I gave last injection on April 29. Patient could eat without pain and distress any kind of food, and gained 17 pounds in weight in two months. The good result has now lasted for over 15 months, no colicky or crampy pain, no desire to induce vomiting, the flat swelling before mentioned has disappeared.\*

Reviewing briefly the histories of these two cases, they prove in my opinion that not all dilatations of the stomach need necessarily be subjected to the knife of the surgeon, in opposition to Dr. Murphy, of Chicago, who, in an address delivered a few years ago in Philadelphia, stated that all cases of dilatation of the stomach ought to be sent to the surgeon. Just to mention shortly, I have used allylsulfocarbamid (thiosinamin) in other cases of scar tissue and fibrous tissue, as for instance, at first more for ocular evidence, in two cases of very tight disfiguring scars on the neck below the ear, resulting from suppurative glands, with the effect that the skin became decidedly loosened, and the scar markedly flatter, in a case of cirrhosis of the liver, the result of which I cannot tell yet; in which case, however, the urine, which had contained enormous amounts of bile-pigment cleared up. And at the present time, I am using it in a case of valvular disease of the heart, and in a case quite similar to Case II, in which was found motor insufficiency of the stomach, hyperchlorhydria, enlargement in the pyloric

\* January, 1907: Patient has remained well and is in good condition, almost 3 years after treatment.

region. This case had been treated for the last eight years as nervous dyspepsia.\*

While I am well aware that the number of patients treated by me by the oil method or by allylsulfocarbamid (thiosinamin) does not justify proclaiming either method as a special cure, it is nevertheless worth while to remember that encouraging results can be obtained by this treatment in well-selected cases, and I believe these methods should find a place in the medical treatment of benign strictures before they are sent to the surgeon.

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### METHOD FOR THE DETERMINATION OF *B. TYPHOSUS* AND *B. COLI COMMUNIS* IN MILK AND WATER.<sup>1</sup>

BY

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The problem of isolating the typhoid bacillus from water, milk, etc., has occupied the attention of many bacteriologists, and a number of methods have been presented, all, so far as I am aware, following the same general rule of using some acid to retard the growth of, or kill all other organisms than *B. typhosus* or allied germs, and recommending the use of from one to ten

drops of the suspected liquid in about 10 cc. of culture media. Thus, Ufflemann, in 1891, recommended that eight drops of a 5 percent solution of citric acid be added to 10 cc. of gelatin tinged with methyl violet. He claimed that typhoid colonies presented a deep blue color and could easily be recognized. Dunbar, however, proved that *B. typhosus* could not live in a media of citric acid of the strength recommended by Ufflemann, but that *B. coli communis* readily developed. Holtz, in 1890, recommended potato gelatin, acidified .05 percent with acid carbolic. Parietti in the same year recommended the use of a fluid as follows:

Carbolic acid, . . . .	5 grams.
Hydrochloric acid, . .	4 "
Distilled water, . . .	100 "

He recommended that three tubes, each containing 10 cc. bouillon be inoculated with from one to ten drops of suspected water, and three, six and nine drops of this fluid added to one of each, and at the end of 24, 48 and 72 hours, plating is done.

Vincent, in 1890, proposed that water be introduced into a test tube containing sterile peptone-bouillon, and five drops of a 5 percent solution of phenol added and incubated; these methods, together with a number of others, are similar, and all result in more or less failure.

In my opinion the quantity of suspected material used in such tests is often inadequate, the proof of which may be obtained from almost any bacteriologic laboratory where such examinations are made. In the laboratory of the Bureau of Health of Philadelphia, I understand upwards of 2,000 samples of milk were examined for *B. typhosus*, all proving negative, but *B. coli communis* was found in many.

Being called upon to determine the source of typhoid infection in the State Hospital for the Insane at Norristown, during August, September and October of 1905, I resorted to all of the usual methods, making several hundred inoculations, and failed to find *B. typhosus*, but in some instances found *B. coli communis*. After repeated failures, and not being able to learn of any methods other than those already used, and giving much thought to the subject,

\* January, 1906: In the last two cases, improvement has been remarkably pronounced, though of course the time is too short to speak of cure.

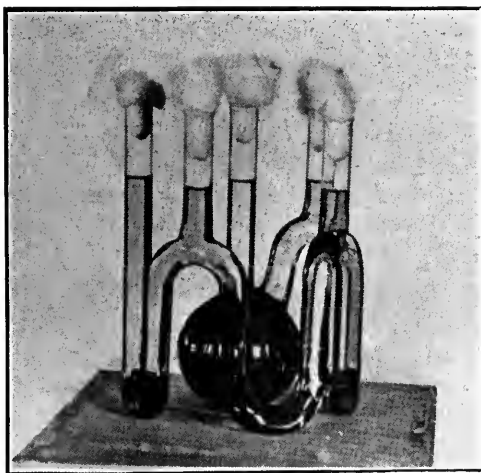
<sup>1</sup> Read before Philadelphia's Pathological Society, November, 1906.

it occurred to me that in the first place, milk is an ideal culture medium for *B. typhosus*, and that Parietti's fluid in definite quantities destroys most bacteria, but leaves *B. typhosus* and allied organisms alive; and that, therefore, it might be advantageous to take suspected milk itself as the culture medium and to destroy most of the ordinary germ life with Parietti's fluid.

Sterile nutrient bouillon to the amount of 300 cc. was placed in sterile flasks, infected with typhoid, and various amounts of Parietti's fluid was added to each flask, beginning with 2.5 cc. the highest being 4 cc. Pure cultures of *B. typhosus* were obtained from each. Four flasks were infected, and 4.2, 4.6, 4.8 and 5 cc. Parietti's fluid added respectively; culture was obtained from the flask containing 4.2 cc. Parietti's fluid, the remainder being sterile. Three additional flasks were prepared and received 4.3, 4.4 and 4.5 cc. Parietti's fluid respectively and cultures were obtained from each at the end of 48 hours. This showed that the limit of use of Parietti's fluid was 4.5 cc. to each 300 cc. of liquid used. Experiments were then made with sterilized milk, infected with known *B. typhosus*, and after repeated trials, the following was adopted: 300 cc. of suspected milk were introduced into each of three sterilized flasks, to which were added 3.4, 4 and 4.4 cc. of Parietti's fluid respectively, and well shaken and the flasks placed in the incubator at 40° C. At the end of 24, 48 and 72 hours, culture plates were made from each, and typical colonies of *B. typhosus* were found in one sample of suspected milk. Several other trials confirmed this, and pure cultures were carried through the various media, tested for indol and phenol; and "Widal" reactions were made with all suspected cultures. After demonstrating to my own satisfaction that I had found *B. typhosus* in the milk, water from the farm, from which the infected milk was bought, was obtained, and the same method was used, except that a concentrated bouillon was made, and added to the water to give proper nutrient material for the growth of germ life; here *B. typhosus* was also found.

Subsequently it was found that the dilution of the suspected milk with about an equal quantity of boiled distilled water gave good results, and further that if an Earlenmyer flask is used for this culture, it should not be over one-half full, as the cream rising to the top thickens and is not readily broken when the culture is shaken to obtain material for plating unless ample room is left in the flask.

Failures in a number of cases during practical examinations in which I had every reason to believe *B. typhosus* should be found caused me to make all first cultures anaerobic, which of course eliminated all aerobes with that much



Starkey's Labyrinth Modified.

more chance of success, and anaerobic culture as a routine in this work is recommended.

Since the discovery mentioned, Starkey published an article<sup>1</sup> in which he described an original method for the isolation of *B. typhosus* and *B. coli communis*, depending on the motility of the germ. He used a labyrinth of glass tubing with a bulb at one end, with tubulars at the upper curvature of each limb of the labyrinth. He filled the apparatus with bouillon, acidulated .05 percent with pure carbolic acid, the openings plugged with cotton wool and the whole sterilized. Inoculations are made at the bulb end, and the apparatus is

<sup>1</sup> Journal American Medical Sciences, Vol. cxxxii, page 109.

then subjected to perfect anaerobic conditions and placed in the incubator. At the end of 24 to 48 hours, 1 cc. of the fluid is removed from the individual tubulars, beginning with the one nearest the bulb, and a plate made of each. He found that the typhoid bacilli travel faster and farther than the colon bacilli, and usually show up one or two tubes ahead of the colon bacilli; and in this way he was always able to obtain pure cultures of typhoid at the end of 48 hours.

Desiring to simplify my method and to do away with the large amount of plating necessary, I determined to combine the two methods, and to that end had a labyrinth constructed following Starkey's plan, but in more compact form (see illustration) which allows the use of a novel anaerobic jar. The labyrinth was filled with bouillon acidulated with Parietti's fluid in the proportion of 4 cc. to each 300 cc. of fluid, and the whole sterilized. After cultivation for 24 to 36 hours of the suspected milk or water as I have described, about 25 cc. of the culture was added to the almost filled Starkey labyrinth, and as a result pure cultures of *B. typhosus* were readily obtained from the third or fourth tubular at the end of 24 or 36 hours.

## CLINICAL NOTES.

### A PATIENT'S STRUGGLE FOR DEXTROCULARITY.

BY  
GEORGE M. GOULD, M.D.

In the May, 1906, issue of *American Medicine* I reported the case of a patient, a physician, who had suffered atrociously for 30 years. His single disease had been eyestrain, at least up to the time when insane surgery had not added its possible of injury and insult to the man's already overgreat misery. This outrage consisted in tearing out the four healthy trunks of the infraorbital and supraorbital nerves. So blunderful was the operator, *quâ* surgeon, that he had destroyed the function of the levator, the motor nerve raising the right eyelid, and the man had complete ptosis of this lid. As I

suggested in my former report, one could hope for little relief when terrible eyestrain and surgery had done their worst. I expected to do so little toward cure, or even relief that I thought the case history at an end and therefore reported it as if complete. And, as I said, one of the most hopeless of conditions had been needlessly added in the paralytic ptosis of the right or dominant eye. This, in a right-handed man of 38, must prove a great calamity by suddenly throwing into the adult mechanism of dextrality the morbid faculty of absolute sinistricularity.

Following the wearing of spectacles correcting the patient's ametropia there was such great relief of the pain, neuralgia, etc., that there was danger of forgetting the morbid left-eyedness caused by the ptosis. Within a short time the complaints began returning, but they were noticeably vague. Every former one had greatly lessened or disappeared but there was pain in the antrum and other indefinite trouble seemingly as unendurable as before. I begged that the long journey to visit me should again be made.

When the patient came it was soon apparent that the chief source of the present afflictions was that the right eye was shut out from its normal function. The perfect proofs of this were the following:

1. Although there was only a narrow slit between the lids a glimpse could be obtained of the book or of more distant objects by throwing the head far backward; the patient was thus ignoring the sound left eye whose vision was perfect, and he was going about with his head bent back in an extreme and torturing manner in order to gain a glimpse of objects with the preferred right eye.

2. To gain some relief from the suffering in the neck, etc., from this most unnatural posture, the patient had to bend the head forward frequently, and thus there was an incessant rocking of the head far backward and then forward.

3. Vision was decreasing in acuteness in both eyes, and both for distant objects and in reading. Halos and dark spots in the field of vision were appearing, and worrying the patient, ocularly and mentally.

4. The pupil of the left eye was becoming continuously dilated and only partly responsive to light and accommodation.

5. Both eyes, especially as to lids and conjunctiva were becoming morbidly congested and even inflamed.

6. Great drowsiness, complaints of being tired out, etc., were growing worse. The mind was incapable of work, and there was a dull and lethargic condition very noticeable.

7. The morbid efforts to raise the right lid were wearisome and irritating.

8. Most important of all was the continual shutting of the normal left eye and with morbid effort, reading with the right eye.

There was no doubt in my mind that the struggle for dextrocularity was at the bottom of all the mischief and that unless the right eye could be got into function, life-wreck was imminent. The traumatic ptosis must be done away with!

One of our most experienced ophthalmic surgeons was consulted, and after thorough study he refused to operate. He probably had no sympathy with my theory of dextrocularity. He did not see why the left eye should not take up the sole function of vision, feared the operation might not be successful, etc. As I believed the man's life depended upon reestablishing the function of the right eye, I took the patient to another surgeon, Dr. Geo. C. Harlan, of Philadelphia. He consented to operate. Within a week the dominancy of the function of the right eye was restored, and at once all the symptoms enumerated above disappeared. From the last letter dated March 11, 1907, I quote:

"I have been more busy than in years, and am in the best condition. I have no trouble now, and read all that I have a chance to. The lid is up for all practical purposes, but for long distance vision I tilt the head backward a little. If the other eye were gone I could get on well. There are no spots or halos before the eyes; no cloudiness, etc. I have no pain except from colds, or from sneezing. The antrum trouble is well. I feel like a king, and enjoy my work. You have been the best friend I ever had. I am interested in your fight. I am going to read a paper on eyestrain before the next meeting of our State Medical Society.

## THE TREATMENT OF KERATITIS E LAGOPHTHALMO.<sup>1</sup>

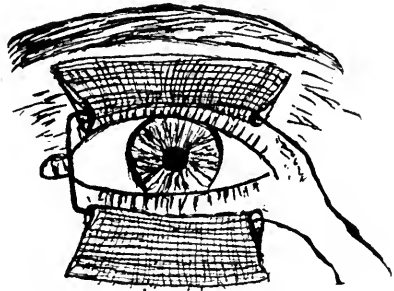
BY

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The problem of approximating the lids in cases of corneal ulceration due to exposure on account of paralytic ectropion or to other causes, is frequently a most perplexing one. There are instances in which the bandage fails, in which adhesive plaster in the presence of excessive lacrimation fails to adhere, and in which, in spite of all measures, the lids persist in separating and ulceration goes on, sometimes to complete destruction of the eye.

Five years ago I devised a simple method of forcibly closing the lids in these cases, which makes the final resort to approximation by su-



Keratitis E. Lagophthlmo.

tures unnecessary, and which at the same time has proved uniformly successful and convenient.

A piece of gauze is folded upon itself and a truncated triangular section is cut out, the folded side representing the truncated portion. In size this should be somewhat smaller than the upper lid. Another piece is similarly cut out for the lower lid. By means of flexible collodion one flap or half of the first piece of gauze is cemented, apex downward, to the upper lid. Likewise one flap of the second piece is cemented, apex upward, to the lower lid. A stout piece of silk thread with the free ends toward the temporal canthus is now placed in the

<sup>1</sup> Read before the Buffalo Ophthalmological Society.

creases made by folding the pieces of gauze over upon themselves. These upper or loose flaps are now cemented with collodion to their respective under flaps already fastened, in such a manner that the cord is freely movable through the loop formed by the gauze. Care should be taken to keep the gauze loops and cord free from collodion. The dressing, when completed, should look like the illustration.

In cementing the gauze to the lids it is well to have the dressing a few millimeters back from the ciliary margin so as to allow room for plenty of traction on the lids. Tying the free ends of the cord will bring the lids in firm apposition. Instillations and medication may be introduced into the conjunctival sac at the pleasure of the surgeon or nurse by untying the silk, after which the lids may again be closed. The dressing is moisture proof and permanent. It will remain adherent ten days or two weeks.

## SPECIAL ARTICLES.

### HYPOTHESIS CONCERNING SOUL SUBSTANCE TOGETHER WITH EXPERIMENTAL EVIDENCE OF THE EXISTENCE OF SUCH SUBSTANCE.<sup>1</sup>

BY

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of Haverhill, Mass.

If personal continuity after the event of bodily death is a fact, if the psychic functions continue to exist as a separate individuality or personality after the death of brain and body, then such personality can only exist as a space-occupying body, unless the relations between space objective and space notions in our consciousness, established in our consciousness by heredity and experience, are entirely wiped out at death and a new set of relations between space and consciousness suddenly established in the continuing personality. This would be an unimaginable breach in the continuity of nature.

It is unthinkable that personality and consciousness continuing personal identity should

exist, and have being, and yet not occupy space. It is impossible to represent in thought that which is not space-occupying, as having personality; for that would be equivalent to thinking that nothing had become or was something, that emptiness had personality, that space itself was more than space, all of which are contradictions and absurd.

Since therefore it is necessary to the continuance of conscious life and personal identity after death, that they must have for a basis that which is space-occupying, or substance, the question arises has this substance weight, is it ponderable?

The essential thing is that there must be a substance as the basis of continuing personal identity and consciousness, for without space-occupying substance, personality or a continuing conscious ego after bodily death is unthinkable.

According to the latest conception of science, substance, or space-occupying material, is divisible into that which is gravitative, solids, liquids, gases, all having weight, and the ether which is nongravitative. It seemed impossible to me that the soul substance could consist of the ether. If the conception is true that ether is continuous and not to be conceived of as existing or capable of existing in separate masses, we have here the most solid ground for believing that the soul substance we are seeking is not ether, because one of the very first attributes of personal identity is the quality of separateness. Nothing is more borne in upon consciousness, than that the ego is detached and separate from all things else—the nonego.

We are therefore driven back upon the assumption that the soul substance so necessary to the conception of continuing personal identity, after the death of this material body, must still be a form of gravitative matter, or perhaps a middle form of substance neither gravitative matter nor ether, nor capable of being weighed, and yet not identical with ether. Since however the substance considered in our hypothesis is linked organically with the body until death takes place, it appears to me more reasonable to think that it must be some form of gravitative

<sup>1</sup>Published synchronously with the Journal of Psychical Research, by courtesy of the Editor.

matter, and therefore capable of being detected at death by weighing a human being in the act of death.

My first subject was a man dying of tuberculosis. It seemed to me best to select a patient dying with a disease that produces great exhaustion, the death occurring with little or no muscular movement, because in such a case the beam could be kept more perfectly at balance and any loss occurring readily noted.

The patient was under observation for three hours and forty minutes before death, lying on a bed arranged on a light framework built upon very delicately balanced platform beam scales.

The patient's comfort was looked after in every way, although he was practically moribund when placed upon the bed. He lost weight slowly at the rate of one ounce per hour due to evaporation of moisture in respiration and evaporation of sweat.

During all three hours and forty minutes I kept the beam end slightly above balance near the upper limiting bar in order to make the test more decisive if it should come.

At the end of three hours and forty minutes he expired and suddenly coincident with death the beam end dropped with an audible stroke hitting against the lower limiting bar and remaining there with no rebound. The loss was ascertained to be three-fourths of an ounce.

This loss of weight could not be due to evaporation of respiratory moisture and sweat, because that had already been determined to go on, in his case, at the rate of one-sixtieth of an ounce per minute, whereas this loss was sudden and large, three-fourths of an ounce in a few seconds.

The bowels did not move; if they had moved the weight would still have remained upon the bed except for a slow loss by the evaporation of moisture depending, of course, upon the fluidity of the feces. The bladder evacuated one or two drams of urine. This remained upon the bed and could only have influenced the weight by slow gradual evaporation and therefore in no way could account for the sudden loss.

There remained but one more channel of

loss to explore, the expiration of all but the residual air in the lungs. Getting upon the bed myself, my colleague put the beam at actual balance. Inspiration and expiration of air as forcibly as possible by me had no effect upon the beam. My colleague got upon the bed and I placed the beam at balance. Forcible inspiration and expiration of air on his part had no effect. In this case we certainly have an inexplicable loss of weight of three-fourths of an ounce. Is it the soul substance? How other shall we explain it?

My second patient was a man moribund from tuberculosis. He was on the bed about four hours and fifteen minutes under observation before death. The first four hours he lost weight at the rate of three-fourths of an ounce per hour. He had much slower respiration than the first case, which accounted for the difference in loss of weight from evaporation of perspiration and respiratory moisture.

The last fifteen minutes he had ceased to breathe but his facial muscles still moved convulsively, and then, coinciding with the last movement of the facial muscles, the beam dropped. The weight lost was found to be half an ounce. Then my colleague auscultated the heart and found it stopped. I tried again and the loss was one ounce and a half and fifty grains. In the eighteen minutes that elapsed between the time he ceased breathing until we were certain of death, there was a weight loss of one and a half ounces and fifty grains, compared with a loss of three ounces during a period of four hours, during which time the ordinary channels of loss were at work. No bowel movement took place. The bladder moved but the urine remained upon the bed and could not have evaporated enough through the thick bed clothing to have influenced the result.

The beam at the end of eighteen minutes of doubt was placed again with the end in slight contact with the upper bar and watched for forty minutes but no further loss took place.

My scales were sensitive to two-tenths of an ounce. If placed at balance one-tenth of an ounce would lift the beam up close to the upper limiting bar, another one-tenth ounce would

bring it up and keep it in direct contact, then if the two-tenths were removed the beam would drop to the lower bar and then slowly oscillate till balance was reached again.

This patient was of a totally different temperament from the first, his death was very gradual, so that we had great doubt from the ordinary evidence to say just what moment he died.

My third case, a man dying of tuberculosis, showed a weight of half an ounce lost, coincident with death, and an additional loss of one ounce a few minutes later.

In the fourth case, a woman dying of diabetic coma, unfortunately our scales were not finely adjusted and there was a good deal of interference by people opposed to our work, and although at death the beam sunk so that it required from three-eighths to one-half ounce to bring it back to the point preceding death, yet I regard this test as of no value.

My fifth case, a man dying of tuberculosis, showed a distinct drop in the beam requiring about three-eighths of an ounce which could not be accounted for. This occurred exactly simultaneously with death but peculiarly on bringing the beam up again with weights and later removing them, the beam did not sink back to stay for fully fifteen minutes. It was impossible to account for the three-eighths of an ounce drop, it was so sudden and distinct, the beam hitting the lower bar with as great a noise as in the first case. Our scales in the case were very sensitively balanced.

My sixth and last case was not a fair test. The patient died almost within five minutes after being placed upon the bed and died while I was adjusting the beam.

In my communication to Dr. Hodgson I note that I have said there was no loss of weight. It should have been added that there was no loss of weight that we were justified in recording.

My notes taken at the time of experiment show a loss of one and one-half ounces but in addition it should have been said the experiment was so hurried, jarring of the scales had not wholly ceased and the apparent weight loss, one and one-half ounces, might have been due to

accidental shifting of the sliding weight on the beam. This could not have been true of the other tests; no one of them was done hurriedly.

My sixth case I regard as of no value from this cause. The same experiments were carried out on fifteen dogs, surrounded by every precaution to obtain accuracy and the results were uniformly negative; no loss of weight at death. A loss of weight takes place about 20 to 30 minutes after death which is due to the evaporation of the urine normally passed, and which is duplicated by evaporation of the same amount of water on the scales, every other condition being the same, *e.g.*, temperature of the room, except the presence of the dog's body.

The dogs experimented on weighed from 15 to 70 pounds and the scales with the total weight upon them were sensitive to one-sixteenth of an ounce. The tests on dogs were vitiated by the use of two drugs administered to secure the necessary quiet and freedom from struggle so necessary to keep the beam at balance.

The ideal test on dogs would be obtained in those dying from some disease that rendered them much exhausted and incapable of struggle. It was not my fortune to get dogs dying from such sickness.

The net result of the experiments conducted on human beings is that a loss of substance occurs at death not accounted for by known channels of loss. Is it the soul substance? It would seem to me to be so. According to our hypothesis such a substance is necessary to the assumption of continuing or persisting personality after bodily death, and here we have experimental demonstration that a substance capable of being weighed does leave the human body at death.

If this substance is a counterpart of the physical body, has the same bulk, occupies the same dimensions in space, then it is a very much lighter substance than the atmosphere surrounding our earth which weighs about one and one-fourth ounces per cubic foot. This would be a fact of great significance, as such a body would readily ascend in our atmosphere. The absence of a weighable mass leaving the body at death would of course be no argument

against continuing personality, for a space-occupying body or substance might exist not capable of being weighed, such as the ether.

It has been suggested that the ether might be that substance, but with the modern conception of science that the ether is the primary form of all substance, that all other forms of matter are merely differentiations of the ether having varying densities, then it seems to me that soul substance which in this life is linked organically with the body, cannot be identical with the ether. Moreover, the ether is supposed to be nondiscontinuous, a continuous whole and not capable of existing in separate masses as ether, whereas the one prime requisite for a continuing personality or individuality is the quality of separateness, the ego as separate and distinct from all things else, the nonego.

To my mind therefore the soul substance cannot be the ether as ether; but if the theory that ether is the primary form of all substance is true, then the soul substance must necessarily be a differentiated form of it.

If it is definitely proved that there is in the human being a loss of substance at death not accounted for by known channels of loss, and that such loss of substance does not occur in the dog as my experiments would seem to show, then we have here a physiological difference between the human and the canine at least and probably between the human and all other forms of animal life.

I am aware that a large number of experiments would require to be made before the matter can be proved beyond any possibility of error, but if further and sufficient experimentation proves that there is a loss of substance occurring at death and not accounted for by known channels of loss, the establishment of such a truth cannot fail to be of the utmost importance.

One ounce of fact more or less will have more weight in demonstrating the truth of the reality of continued existence with the necessary basis of substance to rest upon, than all the hair-splitting theories of theologians and metaphysicians combined.

If other experiments prove that there is a loss of weight occurring at death, not accounted

for by known channels of loss, we must either admit the theory that it is the hypothetical soul substance, or some other explanation of the phenomenon should be forthcoming. If proved true, the materialistic conception will have been fully met, and proof of the substantial basis for mind or spirit or soul continuing after the death of the body, insisted upon as necessary by the materialists, will have been furnished.

It will prove also that the spiritualistic conception of the immateriality of the soul was wrong. The postulates of religious creeds have not been a positive and final settlement of the question.

The theories of all the philosophers and all the philosophies offer no final solution of the problem of continued personality after bodily death. This fact alone of a space occupying body of measurable weight disappearing at death, if verified, furnishes the substantial basis for persisting personality or a conscious ego surviving the act of bodily death, and in the element of certainty is worth more than the postulates of all the creeds and all the metaphysical arguments combined.

In the year 1854 Rudolph Wagner, the physiologist, at the Göttingen Congress of Physiologists, proposed a discussion of a "Special Soul Substance." The challenge was accepted, but no discussion followed and among the 500 voices present not one was raised in defence of a spiritualistic philosopher. Have we found Wagner's soul substance?

## DIGEST OF LITERATURE.

### ACTINOPHYSIOLOGY AND ACTINOTHERAPY.

BY

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of Plattsburg, N. Y.

*Retardation of Growth Caused by Röntgen Rays.*—Forsterling (Zentralblatt für Kinderheilkunde, Sept., 1906) exposed the young of various animals and the buds of various trees to an amount of röntgen rays less than that used therapeutically and found that the subsequent growth was checked—even one exposure of ten minutes was sufficient. Halberstaedter (Berlin. klin. Woch., Jan. 16, 1905), by numerous

experiments with female rabbits, found that the ovaries were atrophied and more or less completely devoid of Graafian follicles by an amount and intensity of röntgen rays which were harmless to the surrounding and intervening more stable tissues. Albersschönberg (quoted by Bost. M. & S. Jour., Feb. 9, 1905) caused azoospermia in rabbits by exposing the abdomen to röntgen rays. Similar conditions in man as a result of röntgen rays are too well known to need comment. Dr. Sinclair Tousey (N. Y. Med. Rec., May 20, 1905), by exposing a pregnant cat to röntgen rays such as is usual in taking radiographs, caused it to abort dead kittens, though before and after it had normal litters. These observations show that germ or embryonic cells, or any cells which have the power to proliferate are more easily killed by röntgen rays than adult cells. Arthur Holding, of Cornell (N. Y. Med. Rec., Mar. 25, 1905), in describing the malignant growths and intractable ulcers of röntgen-ray workers, states that the first symptom is a degeneration and absorption of the lymphatic glands. Dr. C. R. Bardeen (Science, June 29, 1906) states that if frog spermatozooids are exposed to röntgen rays to a degree which does not kill them, the ovum fertilized by them at first develops normally, but later becomes markedly deformed. The danger of exposing pregnant women, or children, to röntgen rays is therefore quite evident. The matter is of much importance in that the damage, if any is caused, may not be noted until long afterward when its real cause is forgotten.

*Dangers of Röntgen Rays.*—Dr. David L. Edsall, at the last meeting of the Amer. Med. Ass'n (Jour. A. M. A., Nov. 3, 1906), presented sufficient evidence to cause everyone to hesitate before prescribing röntgen rays for any purpose. They should be put in the class of anesthetics—usually safe but so apt to do harm that they must never be used without necessity. Edsall mentions the fact that there seems to be an especially severe effect upon bone marrow, spleen and lymphoid tissues, places where cells are undergoing rapid multiplication. He finds also that nitrogen metabolism is often profoundly altered, the nitrogen output increased, particularly uric acid and purin, which with the phosphates, indicate destruction of protonuclein. Indeed nephritis may follow. Hence it is not always safe to prescribe them in certain anemias, toxemias, or nephritis. On account of the increasing evidence of the destruction of developing cells by all the short rays, it is evident that Edsall's warning deserved far more

attention than was given to it. The new dangers are of an entirely different class than the old necroses from excessive exposure, or the sterilization of the operators. These have all been explained by Dr. Milton Franklin, of New York (Archiv. of Röntgen Ray, Jan., 1905), and many other writers. Even in the blood, the proliferating cells show the effect of röntgen ray. Dr. Roger S. Morris (*American Medicine*, Dec., 1905) states that in rats and rabbits experimented upon, the leukocytes were diminished, followed later by a slight increase mostly of polynuclears. Lymphocytes were especially affected, and showed material changes. The red cells and hemoglobin did not seem to be affected. The results found by Edsall and Morris have also been found by numerous European experimenters (La Tribune Medicale) but they did not seem to realize the fact that the main effect is upon youthful or proliferating cells.

*Retardation of Growth due to Radium.*—Dr. Robert Abbé, of New York, has exposed seeds to radium, and found that if they were not killed by too much exposure, the resulting plant was stunted in proportion to the time of the seed exposure. Dr. C. S. Gager, of the New York Botanical Garden, has shown that the gaseous emanation from decaying radium stimulates plant growth to a certain degree, but if the gas is excessive in amount it retards growth. Here again, it is the embryonic cell which is so easily damaged. Many experimenters have exposed all kinds of eggs and larvae to radium and found identical results—checking of growth or even slow death if the exposures are long enough. Development is also interfered with, so that caterpillars may live on in that state and do not turn into the moth. It would be interesting to know if the application of radium to the ovaries or testicles for an appropriate time would not destroy their function. If so, this method might be used in place of excision of these organs when pathological conditions demand such procedure.

*Retardation of Vegetable Growth by Sunlight.*—It is now an accepted fact among botanists that light checks vegetable growth and that darkness stimulates it. Professor MacDougal, of the Carnegie Institution, has written largely of his work in this direction. This is hard to understand when we all know that the plant as a whole depends upon light, but it must be remembered that the light is the means of decomposing the carbonic acid of the air. The leaves are merely the food gatherers for the growing cells in the dark under the bark, and if the light is excessive even the leaves die.

Vines grow enormously in the dark if they are supplied with food but they are checked in growth as soon as they reach the light. They must be protected from excessive light and this is accomplished in many ways. Duggan (Science, June 23, 1905) states that it has been found that "there is a certain economic light intensity beyond which there is no increased photosynthetic activity and only injury." Plants differ enormously, of course, as to the degree of light they need to supply them with nutriment.

*Animal Growth is Checked by Light.*—The last fact in this remarkable series has been furnished by an experiment the writer has performed with some white rats. These animals have no pigment to protect them from the harmful effects of light and they live in more or less darkness, of necessity. A mother and her two young ones were kept in a wire cage in a south window at Plattsburgh where the sunshine is never strong. Although it was in February and there were frequent cloudy days, it was



Young rats sickened and stunted by sunlight.  
Mother apparently uninjured.

noticed that one of the young ones ceased to grow and that the growth of the other was greatly checked. The room was of the same temperature as the cellar where they were born, and all the other conditions were kept the same except the light. The photographs were taken in April, and show the manner in which the animals would thrust their heads into a corner to escape the light glare. The young ones were evidently sick when the picture was taken. In June the smaller one disappeared, probably having been killed and eaten by the adults, but it had not grown any, though it had been removed to the cellar. By July the larger one had grown a little more, but it became

blind and was accidentally killed. These results are in line with the experiments upon young mice with radium. L. Blanc (Compt. rend. Soc. de biol., 1892) described numerous experiments in which incubating eggs were exposed to concentrated light, and states that the organism was more or less damaged, the cells seeming to be "confused or hindered" in their multiplication. The effect of short exposures was so lasting, that various monstrous forms resulted. "There seemed to be a relation between the intensity of the light and the gravity of the disturbance in the embryo." These are very significant words coming from a time when everyone believed that light was too good to do harm to any living thing. J. A. Allan (Science, Nov. 24, 1905) describes a law applicable to nearly all birds and mammals. If a genus extends far north and south, the species in the north are the largest and those nearest the tropics the smallest. Similarly if a species is widely extended, the individuals from high latitudes are considerably larger than those nearer the equator. The cause is not known, but in view of the retardation of growth known to be caused by light, it is reasonable to assume that it is due to the light of low latitudes and not the heat.

*Darkness Needed in Breeding Certain Animals.*—I have been informed by Professor J. George Adami, professor of pathology in McGill University, that he could not carry on certain experiments in heredity because the animals (guineapigs, rabbits, etc.) would not breed. They were kept in wire cages in a brilliantly lighted room, and had no protection from such excessive light. Normally all such animals are kept in the dark cellar or in boxes having dark closets in which they can hide. In the wild state animals invariably select dark places for their young, just as the domestic cats do. It is quite likely that the light affects the germ cells injuriously. The facts, anyhow, are in line with all we know about the sterilizing effect of röntgen ray, radium and light ray upon germ cells. It is also known, by the way, that certain breeds of domestic animals which are ill-supplied with pigment, such as white swine, do not flourish in low latitudes like the black varieties.

*Is Human Growth Retarded by Sunlight?*—As a general rule, races of men tend to short stature in lands of excessive sunshine, such as the tropics, but increase in height in proportion to the darkness. The tallest men on earth live in the darkest place—the northwest corner of Europe. The Patagonians and Eskimo of

the north of Greenland—our two extremes—are notoriously tall, but tropical Indians are short. The Eskimos are well pigmented to protect them from the snow-glare, but that affects mostly the face, for the body is heavily clothed the year round. Perhaps excessive heat retards human growth also. Some of the negro races are quite tall, in spite of the heat and light, though never as tall as Scandinavians and Scotchmen. Cities are notorious for the light glare which is absent from the green clad rural districts, and city dwellers the world over are shorter than the surrounding population. The Jews are city dwellers and are always shorter than the nations they dwell among. City boys are shorter and frailer than country boys. Clothing makers cater to the city trade and the country mother always orders clothes two to five sizes larger than the real age calls for. It all seems to be due to the stunting effects of excessive light, for no other reasonable cause has ever been suggested, and, moreover, as the effect is seen in the children, it is in accordance with all that is known of the active effect of all rays on young or multiplying cells but not on adult cells. As in the case of the white rats mentioned above, adult men and women can endure a degree of light injurious or fatal to their children. Country-bred parents who move to the city may outlive all their city-born children. European children born in India must be sent home to survive, while their parents remain, because less injured by the climate. Dr. W. Hartigan (Jour. Trop. Med., Jan. 15, 1906) states that big men do not get along so well in the tropics as the little ones. Livingston, Stanley, Emin and Johnston were not big and Lords Wolseley and Roberts were even below par physically. The reason for this phenomenon is not known. It is interesting to know that nature, in stunting the races of the tropics, in some way is making them better fitted to their environment.

*Diseases of Nocturnal Animals in Zoological Gardens.*—The nocturnal animals in their wild state hide away in the dark until after sundown, but in zoological gardens they are pitilessly exposed to daylight all day long in order that visitors may see them. Consequently they suffer from all kinds of obscure diseases and the mortality is high. They are somewhat protected by hair or feathers, but the eye suffers mostly, and choroiditis seems to be universal among them. There is also an increase of such diseases among white men in the tropics, for the retina and iris are insufficiently protected. It is quite likely that statistics will show that in

America, particularly in the South, the blue-eyed types suffer far more from all eye diseases than the brown-eyed. Definite data on the subject are urgently needed. Nystagmus, for instance so common among albinos, is said to be comparatively rare among dark brunets.

*Thermic and Actinic Fevers.*—There is an increasing number of references to sunstroke being due to the short and not the long rays. Yet thermic fever is a well-recognized condition which may occur in darkness. Indeed, negroes who are well protected from light are at a disadvantage in great external heat, which their black skins absorb, as in fire-rooms, and according to the 1905 report of the Surgeon-General of the army, they suffered nearly twice as much from heat-stroke as white men. When the external heat is not excessive, the negro is at an advantage because he radiates more. According to Felkin (Archiv. of Röntgen Ray, Oct., 1905) Europeans in Africa have a constant axillary temperature of 99.5, Arabs 99.14, negroes 97.8, and the European's temperature increases .005 for every 1° F. rise in the air temperature. Drs. Schmidt and Stephan (Neue Militärische Blätter, Aug. 20, 1903) by experiment proved that heat rays penetrate the scalp and skull into the brain, if there is no hair protection, and the same has been repeatedly proved of light rays also. The masses of hair of tropical natives may then be a protection from both heat and light. In giving the modern light bath, if the head is not carefully protected, there are quite apt to be headache, syncope and even alarming symptoms, which differ in no respect from sunstroke. There is increasing evidence, then, that there are numerous varieties of sunstroke, and while some may be merely thermic fevers, others are real actinic fevers. The simple continued fever which was formerly more common after injudicious use of röntgen rays is undoubtedly an actinic fever and many of the simple fevers of the tropics of unknown cause will probably be so classified in time.

The difference between "heat-stroke" with its hyperpyrexia, and "sunstroke" with little or no fever has been long known. The former is known to be thermic and occurs in any heated atmosphere, with or without sunshine. The latter is the result of the sun's rays impinging upon the head; "death appears to be due to some profound disturbance of innervation, the heart stopping in diastole, just as when the vagus is irritated." Richlin (Bull. Méd. de Quebec, Aug., 1906) describes the two conditions and mentions that the two terms "heat-

stroke" and "sunstroke" were first used by Jacobasch, of Berlin, in 1878.

*Thermic and Actinic Neurasthenias.*—The exact changes in nerve cells due to the long and short rays have not yet been worked out, though the degeneration and necrosis due to excessive applications have been long known. Obersteiner (Wiener klin. Woch., 1904) has described the nerve changes in mice which had been subjected to radium for from one to four days. They generally died, but some lived three to five weeks, with symptoms indicating profound alteration of the nervous system, and the microscopic appearances were indicative of more or less destruction of nerve tissue and inflammation of connective tissues—probably of the same order as the changes in plant seeds similarly treated. Both heat and light rays, in moderation, cause a stimulation which if long continued is followed by exhaustion. Dr. H. F. Lange Ziegel noticed the phenomenon in northern visitors in Los Angeles, Cal. (N. Y. Med. Jour., Dec. 15, 1906); Felkin mentions the same phenomenon in the tropics—great mental and nervous stimulation for a few months, then depression; Dalrymple, quoted by Giles (Climate and Health in Hot Countries) mentions the sense of renovation in new comers in Egypt; and very many have described the eventual nervous exhaustion in the tropics. It is not entirely due to the heat, or perhaps not at all, for the heat is not any worse in Egypt than in our South, and the phenomenon is quite common in the Arctic summer. Dr. F. S. Byles mentions the same phenomenon as to Denver (Med. News, Nov. 26, 1904), residents being frequently compelled to move away.

In an article by the writer (N. Y. Med. Record, Dec. 23, 1905) data have been collected to prove that sunlight, in amounts too great for the degree of protective pigment, causes a stimulation of the nervous system, followed in time by exhaustion. The disease is more frequent in our South than in the north, more frequent and severe in blonds than in brunets, and is made worse in sunny climates but lessened or cured in cloudy ones. It is relatively rare in Europe where each population is pigmented in proportion to the amount of sunshine, but is extremely common in America, where most of the people are farther south than their ancestral home in Europe. The yellow haired race is healthy in dark Scandinavia, but neurasthenic here and always has died out if it migrated to sunny climates. The Surgeon-General's reports show that our soldiers are the healthiest in the northeast and northwest corners of the

United States and in Alaska, for these places have climates approximating those of northern Europe. Dr. Victor E. Watkins has noticed (N. Y. Med. Jour., 1906) that neurasthenia is quite common in the blonds in the southwest. Hartigan (Jour. Trop. Med., Jan. 15, 1906) mentions the fact that blonds do not survive the tropics as well as brunets and Havelock Ellis in a personal letter states that noted tropical explorers tend to be dark—the fair ones do not become noted as they die soon in spite of their superior energies or indeed perhaps by reason of their strenuousness. The insane in New York State (N. Y. Med. Jour., Dec. 23, 1905) are reported to me by Dr. W. L. Russell, of the Commission in Lunacy, as being more blond than the general population is assumed to be—although there are no accurate statistics of the general population for comparison. This blondness is to be expected if excessive light is a cause of nervous breakdown.

Dr. W. W. King has found neurasthenia so frequently in Porto Rico, that he gave it the name of tropical neurasthenia (Jour. A. M. A., May 19, 1906), not that it differed from neurasthenia contracted further north, but merely to indicate its prevalence in the tropics. The writer first called attention to this condition as a tropical neurasthenia in the Philippines (Phila. Med. Jour., 1900) and Dr. Louis A. Fales, of Madison, Wis., has since done so independently. There is some doubt in the mind of Dr. King that light is the cause of the condition, but it differs little from the undoubted actinic neurasthenia found among röntgen-ray workers as a result of long-continued exposure to weak röntgen rays or the "röntgen-ray atmosphere." Dr. H. W. Van Allen (Bost. Med. and Surg. Jour., Mar. 9, 1905) describes these cases in considerable detail, their indigestion, insomnia, inability to concentrate the thoughts and a long line of symptoms. It is a good description of the bad cases found in the Philippines. Dr. F. H. Millener, of Omaha, formerly of Buffalo, N. Y., describes an identical condition of electricians working in currents of high voltage, (American Medicine, Aug., 1906) around which there are actinic waves of great intensity.

The nervous breakdown of naval officers has been repeatedly mentioned in foreign services, and also hinted at in our own, but at last there is a clear statement of the conditions by Dr. Corben J. Decker, a surgeon in the United States navy. His article (Jour. of the Ass'n of Mil. Surgeons, Oct., 1906) shows a bad state of affairs and there is no doubt that the modern warship is unwholesome. From one ship—the Kear-

sarge—in three years 264 men were sent to hospital, or discharged the service for sickness, or died. In the fleet of four ships five officers broke down with neurasthenia.

The heat of modern ships is the main factor enlarged upon by Decker, though bad ventilation is also blamed. If guns are fired at their maximum rate, the crew is prostrated by exhaustion before half the ammunition is expended. The engineer force is the greatest sufferer, and to make matters worse, it is given the hottest sleeping places. Its sick record is 30 percent higher than the rest of the crew. The conditions are far worse in the tropics. At the battle of June 11, 1899, in Manila Bay, the engine and fire-room forces were so overcome by heat exhaustion by noon, that one ship could not be moved and had to come to anchor. A plea is made to reduce tropical cruises to a maximum of four to six weeks, and then a quick return to cooler air. It is claimed that the bad showing made by the Russian fleet in the late war was partly due to the exhaustion of many months in Madagascar and the Indian Ocean, while the Japs rested in the cool north, and the same is said of the condition of Cervera's men at Santiago. Officers who are invalidated for nerve debility recover in a surprisingly short time after transfer to cold climates. The facts do not admit of doubt as to the cause of this new danger which is undermining all modern navies. These naval cases are thermic and not actinic neurasthenias. The chronic neurasthenias, which generally follow "heat-stroke" or "sunstroke," are apparently the same as the more slowly developed cases.

*Cold Cloudy Climates and Darkness for the Neurasthenic.*—Dr. Wm. House (Medical Sentinel, Portland, Oregon, Mar., 1906) calls attention to a fact long known in the eastern part of the United States, namely, that sanatoriums in the cloudy and cold north are remarkably successful in the treatment of neurasthenic states. Patients from sunny climates improve as soon as admitted. Sometimes three weeks makes a remarkable change for the better and an apparent cure, but the patients relapse as soon as they return home. In addition House states that three days of sunshine will make manic patients restless and talkative, and aggravate their condition, but that they improve with cloudy weather. It is quite evident, then, that neurasthenics and all cases of mental excitement should be sent north to cool or cold cloudy climates. They do remarkably well in the mountains of New York, but get worse in the sunbaths of the south. If removal is impos-

sible, they should be shielded from the light. Dr. Allan McLane Hamilton, in a personal letter, states that for many years he has advocated the use of the darkened room for several hours daily, with a few hours of cheerful sunshine (for the psychic effect) in his "rest cases" and they have improved when they would not under the conventional and popular treatment of "plenty of sunshine and fresh air." Dr. G. R. Rowe, of London, was equally successful in similar cases as long ago as 1817 (Hypochondriasis, John Churchill, London, p. 43). He darkened the room to keep out "the rays of light from offensively acting on the retina and consequently the censorium commune." The modern mania for the stimulation of sunshine has blinded us to the dangers of a stimulant, and we have forgotten these old clinical practices. Leonard Williams (Edinburgh Med. Journal, Mar., 1905) calls attention to the damage done to nervous patients by the stimulation of high altitudes, and the necessity for "relaxing" or soothing climates at low levels with plenty of clouds and moisture.

Dr. Brewer (Jour. of Outdoor Life, 1906) mentions the effects of light in Arizona, the "welcome shelter" afforded by trees, and the fact that neurasthenics must not go there. According to the Medical Sentinel (1906) Dr. C. E. Hill states that the mortality from pneumonia in cloudy Oregon is several percent less than in the east, and Dr. E. A. Pierce stated that tuberculosis is less prevalent, while several speakers at the State Medical Society mentioned the fact that typhoid was rarely severe, and that typical lobar pneumonia and severe scarlet fever were comparatively rare.

*The Advantages of Cloudy Weather.*—Dexter (Weather Influences, Macmillan) gives an enormous number of statistics which prove that dark gloomy weather has the exact opposite of what it is popularly supposed to have. It reduces crimes, misdemeanors and suicides. This is in exact accord with all observations as to the nervous irritability caused by light in excess. An editorial in the *Jour. of the Amer. Med. Association* (Jan. 19, 1907) is pernicious in that it untruly states that suicides and nervous conditions are increased in gloomy weather, and advises greater precautions at such times with these cases. They need guarding in sunny weather. The vital activities are not lowered in cloudy weather, as this editorial states, but the reverse, as shown by the vitality of the Scotch and Scandinavians, who have cloudy weather most of the time. In 1904, London—the darkest city of the world—had the lowest deathrate

of any large city in Europe; London 166, Berlin 257.5, Milan 254, Madrid 256, Vienna 314, Paris 383, Moscow 387. Our dark cloudy cities on the northwest coast also have a much smaller deathrate than the sunshiny ones—about one-third of that of Chicago. It is regrettable that the journal should publish such dangerous nonsense as an editorial. Nervous cases—particularly those with excitement and suicidal tendencies—must be carefully watched after a spell of brilliant weather.

*The Value of Dark Forests.*—Forest sanatoriums have been tried a long time by the Swiss, who acted upon the wellknown fact that forest life is particularly desirable. The results have been so successful that efforts are now being made to excuse this desertion of sunshine. René de Gaulejac (La Presse Médicale) tried to explain away the matter by stating that trees reduce the number of bacteria in the air—though it is not quite evident how that invigorates the patients. It is far from amusing to see a part of the profession advocating trees around our houses to diminish the number of bacteria, and the rest advising the removal of trees, to let God's sunshine kill the germs! It is rarely mentioned that the forest, with its protection from sunlight, is man's normal environment. He gets plenty of cool or cold fresh air, and is better off whether he is sick or well. Brilliantly lighted rooms are, therefore, unnatural, and there is a growing opinion that brilliantly lighted sanatoriums are distinctly pernicious—inducing more nervousness and impeding the curative effects of cold air. Dr. Jos. Walsh, in his account of tuberculosis work in Europe (Johns Hopkins Bulletin, Oct., 1906), does not even mention the need of sunshine, for the sanatoriums are placed in any place and every place and seem equally successful if they furnish the needed rest, cold air and nourishment. New York State has established its forest sanatorium in the Adirondacks where Trudeau blazed the way. Pennsylvania has followed the example with the one in the South Mountain range, and its excellent results (Charities and the Commons, Dec. 1, 1906) prove the wisdom of establishing sanatoriums in dark places.

*The Relationship of Heat, Light, Cold and Darkness.*—Very few physicians seem able to separate the effects of light and darkness from those of heat or cold. The subject is of vital importance, because in exposing a patient to get the necessary amount of cold fresh air to breathe, we are liable to expose him to a degree of sunshine which is injurious. The whole

subject of the management of tuberculosis and pneumonia, for instance, needs explanation on these lines. For these reasons, a review of the recently published facts as to the damage done by heated air and the cures effected by cold air, must enter the discussion of light therapy. G. H. Parker published (The Jour. of Experimental Zoology, Sept., 1906) some experiments which show that heat and cold, as well as light and darkness, cause movements of the pigment cells in the skins of lizards. Curiously enough he finds that cold and light act alike in causing a distal movement, while heat and darkness a proximal one. The heat rays, therefore, do not cause the blanching of lizards on a white surface. The experiments do prove that the slow rays—the red and infra-red—have great biological importance as well as the short ones.

*The Cold Air Treatment of Pneumonia.*—The new treatment of pneumonia was described at the Section on Diseases of Children, of the American Medical Association, by Dr. W. P. Northrup, of New York (Jour. A. M. A., Oct. 13, 1906), the apostle of this remarkably efficient method. It makes one heart sick to think of the untold thousands of sick babies which have lost their lives because we were afraid to give them the only thing they needed—cold air to breathe. It is so simple that it seems marvelous it was not popularized a century ago, to wrap the baby up, put hot-water bottles to its feet, screen it from draughts, and open all the windows even if there be zero weather. Cyanosis fades, respiration and pulse-rate lessen, temperature falls, dyspnea and delirium disappear and the baby sleeps into convalescence, with little or no medicine and that for symptoms. Of course the mother—and grandmother, also—must be convinced that we are not murdering the child, and the nurses must wear furs, but that is not insuperable. The point to remember is that light has nothing to do with these magnificent results which are just as good if not better in a shaded cold room as on the roof.

*Cold Air for all Fevers.*—*American Medicine* suggested editorially (1905), in discussing Northrup's success, that possibly the treatment by cold air was indicated in all fevers. It now appears that he has tried it in typhoid and other infections and always with excellent results. The cold bath treatment reduces typhoid mortality several percent, and makes the disease of different type, devoid of the nervous conditions caused by heat. Perhaps cold air will now become the ideal treatment in typhoid. It has been found particularly beneficial in

puerperal fevers (Bull. of the N. Y. Lying-in Hospital, Sept., 1906) and also in the anemias of pregnancy. It now seems that the roof is destined to be a valuable ward in every hospital, general or special, and is being arranged for the purpose. We trust that the cures will be credited to the real agent—cold air—and that the patients will not be jeopardized by light baths or the glare of sunlight in their faces.

*The Effect of Cold Air.*—The explanation of the systemic action of cold air is yet to be found. Of course it abstracts fever heat like a cold bath, and reduces temperature that way. The nervous tissue is correspondingly benefited because it cannot function properly unless its temperature is normal. Northrop states that it is not a question of oxygen, but the actual stimulation of the cold. The nervous system is pulled together as we see after the cold bath in typhoid. It is not out of place to direct attention to the fact that cold air is the normal for the northern races of Europe who have lived for thousands of years in the most primitive of unheated houses. The warmed air of our modern steam heated homes must be distinctly pernicious at all times and far worse in sickness. Cold air is then merely returning to nature—placing the patient in a normal environment. If this is true, by all means let us reduce the temperature of the sick room or even put all patients out doors whenever practicable. It is wonderful how the sick recover in the tents of military field hospitals, "in spite of the cold," yet it is also noted that in summer when the tents are dreadfully hot and glary the results are not good. It seems that the tissues evolved by thousands of years in the cold environment of northern Europe are not only inured to cold but will not function properly in warm air. As a rule our blond types, derived from the north of Europe, prefer cold weather and the brunets from southern Europe prefer hot, even after several generations here. It is not at all unlikely, then, that statistics of complexions will show that the cold-air treatment, though good in all cases, is better with bright blonds than with dark brunets or negroes. Even winter is better than summer for incipient tuberculosis. Dr. Burnham, superintendent of the Ray Brook Sanatorium in the Adirondacks, informs me that on the approach of cold weather his patients show a remarkable improvement over their summer condition. If the summer sunshine helped them at all, the dark cold autumn weather was better for them.

*Why is Tuberculosis a House Disease?*—The relation of houses to tuberculosis is such a

wellknown fact that it seems unnecessary to pile up more statistics on the subject. It is evident that as houses are hot and shaded, the bacilli do not die as soon as out doors; moreover, the crowding of inmates enables the germs to be easily transferred from sick to healthy inmates. Nevertheless, it is most illogically thought that these conditions affect only the human inhabitants and that they are injured by the conditions which benefit the germs.

The latest statistics are from Paris, and have been reported by P. Juillerat, chief of the "bureau d' assainissement de l' habitation et du Casier sanitaire des maisons"—a new part of the police department. He has originated a system of recording the history of every house, its size, plan, plumbing, location, number of inmates, character of street, diseases it has harbored, changes ordered by the health authorities, and every other fact which bears upon its sanitation. He has published the results of these inquiries in *Hygiène Générale et Appliquée*, Jan., 1906, and *Gazette Méd. de Paris*, Jan. 5, 1907. The statistics only confirm what is already known, that the more the crowding and the worse the ventilation, the greater is the tuberculosis infection.

The lower floors of tenements, for instance, produce the disease much more frequently than the upper ones which have more air from being more exposed to winds. This result is the more remarkable in that the upper floors, being cheaper, are taken by poorer people with large families and are more crowded. Another interesting set of statistics proves that the number of cases of tuberculosis is inversely proportional to the number of windows and doors—again the result of more air. Indeed the disease is a house disease, probably because of lack of cold air. If there are no windows, as in prison cells or as in the houses of Labrador, the infection is awful, and if there are nothing but windows and doors as in the open air, the patients get well and no new ones appear. Fluegge is reported to have proved (Pop. Sc. Mo., Jan., 1907, p. 20) that the ill-feelings developed in crowded, badly ventilated rooms are due to the excessive heat and moisture and not to the air contamination. That is, bad ventilation is hot ventilation and reduces vitality so that the living germs taken in are able to gain a foothold. In open-air life, they have no show because they are injured by the cold and we are invigorated by it, but that does not prove the light to be the agent for improving house sanitation. Indeed the diffused light of ordinary rooms is not strong enough to be lethal to bacilli, though it might be in-

jurious to the human occupants, in the way of causing neurasthenic symptoms.

*Darkness is not a Cause of House Tuberculosis.*—The most malignant cases of tuberculosis arise in the tropics where there is unstinted sunshine, in doors and out. Unless they are sent promptly north into cold air they perish, for the disease is remarkably rapid in the warm air. The most cures are made in our cold northern mountains where the sun is rarely seen and even then its rays are very mild. Nevertheless, the new French house statistics are used to support the old theory that light and not cold air has been the beneficial agent in the houses with the greatest number of openings. It is a very dangerous theory, because it has led to the construction of houses in our tropics which are proving very unwholesome from the excessive light—and our tropical sanitarians are not yet alive to the danger. Juillerat, himself, has attempted to prove that tuberculosis is essentially a disease of darkness, and as long as these baseless deductions are published we will continue to condemn many a patient to death by sending him to bathe in perpetual sunshine while he might have recovered in the cloudy Adirondacks. If merely opening the windows prevents and cures tuberculosis, it cannot be due to the light, for no more of that is admitted through the open window than through the glass—though, to be sure, the glass does stop the ultraviolet rays. Cold air is the agent. Light only harms.

*Light as a Germicide.*—There have been innumerable experiments proving that light, particularly the short rays and the ultraviolet, are lethal to pathogenic organisms, all of which are really "shade-loving plants." Dr. John Weinzirl is the latest to report such experiments. In a paper read before the American Public Health Association in the City of Mexico, Dec., 1906 (J. A. M. A., Dec. 22, 1906) he states that he found that ten minutes' exposure of tubercle bacilli to sunshine was fatal, though he did not mention the latitude or time of day. This, of course, is the basis of the modern treatment of localized infections of all kinds but it is generally forgotten that the tissue cells are also vulnerable, though apparently to a less extent. Following the lead of Finsen in the use of concentrated light for local lesions, there have been a host of imitators and literature is full of their successes with all the short rays, radium, röntgen ray, ultraviolet and violet. There is an opinion expressed that the best frequency for the death of the tubercle bacillus is in the blue area, and that by excluding all

the other rays, infrared, red and ultraviolet, there is no danger of a heat burn, or an actinic injury to the tissues—the blue ray indeed acting more as a local anesthetic. Dr. J. W. Kime (Jour. Am. Med. Assn., June 17, 1905) describes his method of concentrating sun's rays on tuberculous foci of the larynx and chest, by a concave mirror 10 feet in diameter, but he filters out all the heat and ultraviolet rays by passing the beam through 12 inches of cold water. It is merely the Finsen method for deep penetration. As far as the reports go, it is yet to be proved that these rays really do penetrate sufficiently to be of value in deep lesions and whether any advantage over the standard treatment is shown by the results. A streak of charlatanism seems to run through the methods of using röntgen rays on the chests of patients undergoing the outdoor treatment.

*The Dangers of the Light Bath for the Tuberculous.*—There are remarkable inconsistencies in medical literature as to the benefits of light baths to the naked body of the tuberculous. Dr. S. A. Knopf, the brilliant New York specialist, strongly advocates them (Jour. A. M. A., Jan. 19, 1907), although he finds that they may cause "erythema, an urticaria or other cutaneous trouble," headache and elevation of temperature. He even advocates light colored clothes, though these, if thick enough for winter wear, are just as opaque as dark ones. The injury done to the naked body by sunlight, after it has passed through glass, which filters out the ultraviolet rays, may not be very noticeable in the north but I have been informed by a patient from a sanatorium in New Mexico, that naked sun baths were tried there but were so disastrous that they were discontinued. The light was too strong. Dr. Jno. H. Musser says (J. A. M. A., Dec. 29, 1906): "The public should know that in the best sanatorium in this country, with the best possible means at command, in an experience of 17 years, 66 percent of the incipient cases continued well; 28.6 percent of the advanced cases are well, and 2.5 percent of the far-advanced cases remain cured. What a splendid record and what a triumph for Trudeau!" The Adirondacks are noted for the small amount of sunshine and what they have is not strong. In some places they do not see the sun for weeks at a time. The cure seems to be enhanced by the absence of sunlight, if anything. At least cure does not depend upon sunshine. Nevertheless, it is commonly said that the ideal climate for the treatment of tuberculosis must have a "maximum of sunshine" and that "sun<sup>t</sup>

light is to be unstinted in amount." It is difficult to understand of what use sunlight is to a patient who is so muffled up that it cannot reach any part of his body except a few square inches of face, and Knopf even recommends covering that with a black cloth to avoid the annoyance of being awakened by the early morning light. I have also been informed that even clothed patients in Dannemora prison did not do so well in the sunshine as in the shade. Dr. Burnham, of Ray Brook New York Sanatorium, states that sunshine has nothing to do with their remarkable results, as they rarely see the sun. If the Adirondacks have the "best possible means at command," sunlight is not needed. The statistics from the sun-cursed southwest are not specially brilliant. Dr. Malgat, of Nice (Annales de la Société de Med. Physique de 'Anvers, 1905) seems to have been quite successful in using concentrated sunlight from which both the heat rays and chemicals are filtered out by water and glass. This is concentrated upon the chest lesion. He seems to be unaware of the fact that ultraviolet rays are filtered out by the water though he opens the windows to let them in through the glass. That he is dealing with a dangerous remedy is shown by the hemorrhages he causes, and by dangerous symptoms if the applications are too prolonged. The naked sun baths he recommends are promptly fatal in the tropics and proportionately dangerous further north.

Quite an article on the lethal effects of light on all plants and animals has been written by Dr. G. Bohn, of the "College of Science," Paris, and it has been widely commented on in America, probably because it was written in Europe. This is quite amusing in view of the fact that most of his facts and arguments appear to be taken bodily from the American book, "The Effects of Tropical Light on White Men."

*Excessive Heat as a Cause of Tuberculosis.*—Heat is a factor which might, in great part, be responsible for house contagion in tuberculosis, and the matter deserves serious consideration. As above mentioned, the opinion has become quite common that it is not the oxygen but the coldness of it which cures so many cases of tuberculosis, pneumonia, and other infections, by "toning" up tissues. The reverse is probably true. Warm air relaxes to such an extent that tissue resistance is lost. This may be the explanation of the fact that Eskimos, who are immune at home, die of pneumonia in temperate climes. Jamaica negroes perish in Panama, and white men in the tropics are also quite susceptible. There is room for investi-

gation, and it would be interesting to know the relative susceptibility of two sets of animals, kept for long periods in cold and warm air respectively. The experience of hot zoological gardens is quite instructive. Monkeys are accustomed to cold air even in the tropics, and when so managed they do not die of tuberculosis like the denizens of the nasty monkey houses.

The temperature of houses must receive more attention from laymen as well as physicians. The habit of dressing lightly and overheating the house or office is modern and essentially American, though not at all uncommon abroad. A reversal of the process would be a return to nature. A room temperature of 60° or even less is perfectly comfortable if we dress for it and keep out of draughts. Thousands of cured tuberculous patients are compelled to live in cold air most of their time, and there are millions on the way to tuberculosis because they are not living the same way. There has been complaint that school rooms are so hot that students are compelled to dress very lightly. The overcoat is not sufficient extra clothing for out doors and there is consequent chilling.

All the countries of Europe are said to show a reduction in morbidity and mortality rates from tuberculosis in the last 35 years except Norway and Ireland, and these are the cloudiest and darkest countries. Yet recent reports from lighter Labrador reveal a sad condition there, too. The explanation seems to be found in the overcrowding of overheated houses, a fault common to all three places.

*Tuberculosis in Modern Warships.*—Tuberculosis in modern navies is on the increase, though it was a rare disease among the crews of the old wooden sailing ships which had no heating arrangements. In modern ships, steam heat is introduced into every nook and corner. The increased heat is sometimes unbearable and it is not surprising that tuberculosis should be as prevalent as in hot tenements. Fishermen who have an open-air life and unheated cabins are still free of the infection, while among French men-of-war's men its ravages are reported to be dreadful. It is not known why it should appear mostly in those who have had less than a year's service. Perhaps they were infected before enlistment, and the ship life promptly made them worse, whereas in former times such incipients recovered as soon as they went to sea. The cold sailing ship was a sanatorium but the hot modern ship is an incubator for the disease.

The cause of naval tuberculosis is not yet appreciated by naval people abroad. An

attempt has been made in France to lay the blame upon the darkness of modern ships, but it can be denied that they have less light than the lower decks of the old sailing crafts where the sailors congregated. The recent report of the Surgeon-General of the United States navy asserts that the tuberculosis rate, 6.1 per 1,000, is double what it was ten years before, and that the engine force does not suffer as greatly as the deck force, cooks and waiters. The darkness of the engine and fire-rooms should make the engineer rate higher if it is the cause. It is stated, as in the French service, that cases occur mostly in the first and second years of service, as though they were infected before enlistment and developed quickly by the environment.

*Climates in Tuberculosis.*—The value of climate in tuberculosis is certainly misunderstood because such diverse opinions are expressed. For instance, Dr. C. Muthu (Archives of the Röntgen Ray, Dec., 1906) states that "climate or country does not make any material difference in the progress of the disease. Some consultants are very fond of sending their tuberculous patients abroad, but results do not justify their choice. Given an altitude of 800 to 1,000 feet free from dust or smoke, and protected from strong gales and winds, any place in the country will be suitable for carrying out the treatment." Dr. James Burnet (*ibid*) says that "climatherapeutics is undeniably of great importance." and that in sending patients away, it is desirable to select a dry, bracing climate, cold but equable, free of dust and high winds and with much sunshine, and yet he advocates pine forests near the seashore, where there is necessarily moisture and shade. Truly, the experts differ too much, and are inconsistent. On account of these discrepancies and the increasing evidence that tuberculosis is cured about everywhere, there is a growing tendency to consider climate a minor factor if it furnishes plenty of cold air. Yet there is a relation to climate which is very important if not vital.

*Complexions of the Tuberculous.*—Europeans seem to have an increased susceptibility to tuberculosis in the tropics. The same rule should hold for blonds in the United States—at least in its lightest parts. It was once taught that the very light blonds were a tuberculous type, but this is not true, because there is no more vigorous race than the Scandinavians at home. It is only when they migrate too far south that they are injured. Statistics furnished me from one Denver sanatorium show that

brunets are in the majority but in another the blonds are very much more numerous. Adding the two together, three blonds are found for two brunets. Other sanatoriums seem to have more light types than dark, and as the cities from which the cases are generally drawn are notoriously brunet, it does show that the blonds furnish more than their share of the tuberculous. It would seem, then, that if the blond is to be sent away at all, he should not be sent further south, but north to a climate resembling his native one. As far as known, the two classes recover about equally well in the Adirondacks and Denver, but accurate statistics are needed from the more sunny climates. A recent case brought to my attention would lead me to believe that it will be found that very light blonds do badly in our southwest or at least do not show such good results of treatment as those of very dark complexion. This patient improved very greatly as soon as he came north into a colder darker place.

There is a reaction setting in against high altitudes for the tuberculous. Dr. Paul M. Carrington (Jour. Ass'n Military Surgeons, Feb., 1905) states that in Fort Stanton, N. M., at an elevation of 6,000 feet, many patients do badly, owing to defective breathing power. He claims that there is often dyspnea, cyanosis, increased cough, and expectoration, and an increase of the infiltrated area. It is merely one result of transporting an animal to an unsuitable environment. The sea level or a slight elevation is more nearly normal. It is not mentioned how much of the injury at high altitudes is due to the light stimulus.

*Shall Children be Given Light Baths?*—The above facts would seem to show that in light we are playing with a dangerous agent. All other mammals carefully protect their young in the dark, as do the ants and bees and all others which are not heavily pigmented. Woman does the same as far as she can—that is, she did until the modern craze for excessive sunshine possessed the higher races. From the known increase of neurasthenia in those exposed to excessive light, we are safe in ascribing to the same cause the nervous condition of so many children in modern city life. The relation of light glare to the great number of cases of defective eyesight in modern school rooms—33½ percent of all examined—is certainly a point for investigation. Are the blonds any worse than brunets? Leaving aside the deplorable effects upon the eyes of babies, lying in the full glare of the sun, it is time to inquire if they are not actually stunted in growth. We must

find the cause for the better development of country boys.

The lighting of school rooms must now be reconsidered. For some time it has been the custom to design them so that floods of sunshine pour in for its alleged benefit, but if it stunts the growth of every plant and animal in which it has been tested, we are stunting our school children also. Plenty of fresh air is essential, of course, and rooms must be light enough to see well, for either extreme of darkness or glare magnifies eyestrain, or indeed may cause it. It is time to stop and think over this problem of lighting, and discover whether or not we have not gone to extremes as we always do with a new idea. Which is the normal, the quiet, subdued, self-restrained country child, or the nervous, excitable, bright city boy? The glare of the school room or city is far different from the subdued light of the forest where we know we are healthy. Fresh cold air is an absolute necessity, but brilliant light is not.

*Play Grounds for City Children.*—Fresh cold air for the babies did not seem necessary when we were building up our cities with solid rows of houses without breathing room. Europeans awakened to the need long ago, and have torn down blocks of houses to make parks where the babies could be turned loose, to get the cold fresh air they need. The same glorious idea has taken hold in American cities but it was a very feeble hold for awhile. If Philadelphians had known as much as they do now, they would never have placed their public building on a park. They destroyed property worth millions as a park to save a few thousands in the purchase of ground elsewhere. The Starr Garden, at Sixth and Lombard streets, began in an humble way on an ash dump, but in 20 years it grew into a decent sized play ground for children of the neighborhood.

The benefit of city play grounds is incalculable, for they secure healthy development of hundreds of children, instead of the old style "degeneration" which was due to unwholesome confinement in hot houses. This one institution has probably saved hundreds of boys from those illnesses, nervous and physical, which end up in the hospital or prison. It is sanitation of the highest kind. No part of the city or any city should be so congested that the children cannot reach a park or play ground by a few minutes' walk. But let the parks be well shaded, and not the stunting sun baths which are so harmful.

*Action of Light on the Blood.*—It has long been known that there is an increase of iron and an increase of red blood cells at very high

altitudes, as shown by observations on balloonists (Science, Dec. 16, 1904). The cause is unknown, though it has been suggested that there was some relation to the ultraviolet light which is so strong at high altitudes. The *N. Y. Med. Journal* (Jan. 19, 1907) mentions two observations in this line. Haldane has shown that carbonic oxid unites with blood with more vigor in the dark than in the light, while Hasselbach has shown that the amount of oxygen in the blood is markedly affected by light and darkness—though details are lacking. Excessive light is generally recognized as causing increased metabolism, and eventually exhaustion, so that it is a dangerous remedy in states of exhaustion. These recent reports would seem to indicate that the results are due to the increased oxygen-carrying power of the blood. The tropics, with their excessive light, seem to produce a certain amount of anemia irrespective of any infection, so that it is quite likely that light baths will be contraindicated in the treatment of such cases in temperate climates.

*Bactericidal Effects of the Tropical Sun.*—Many observers have reported the curious fact that infectious diseases of northern latitudes do not flourish in the tropics—some of them never being found at all. No explanation of the phenomenon has even been published, but it has always been thought that the lethal effect of the sunshine was the cause. Dr. Martin has reported (Münch. med. Woch., Dec. 18, 1906) some experiments made in Africa, in which various organisms were exposed to the sun and air, and he also made cultures from the air and soil. He reports that pathogenic bacteria are markedly scarce. They require shade or even darkness. This is in accord with what we know of all other tropic plants, which resort to a great variety of schemes to escape the severity of the direct rays of the sun. Many, indeed, do not thrive except in the shade. Perhaps for these reasons cerebrospinal meningitis flourishes in high latitudes. F. Ruhemann (Berlin. klin. Wochen., 1906) has noticed the coincidence of much cloudy weather and the spread of meningitis in the winter. In other words, clouds protect us from sunshine and protect pathogenic organisms also, so that we are saved one danger to be confronted by others.

*Sun Cures for Madagascar Ulcers.*—Drs. Fontoynt and Jourdran (Presse Médicale) report that remarkable results are obtained in sluggish infective ulcers of Madagascar by simply exposing them to the sun. The rest of the body must be protected in the case of white men, but in heavily pigmented natives this

precaution may be unnecessary. At night any simple dressing is applied. It seemed that by painting the ulcers with a five percent solution of eosin the cure was a little more rapid. The dark ultraviolet rays are reported to be the germicidal ones in these cures. The sun cure for wounds is practised by negroes in the West Indies (Editorial, *American Medicine*, 1905), the negro thrusting the part through a window in his hut. Wounds of the feet are ordinarily infected and do badly, but by the sun treatment prompt cures result. Our northern sun is not strong enough, yet Dr. A. H. Ring (Boston Med. and Surg. Journal, Nov. 22, 1906) reports the cure of a persistent bed sore by concentrating sun's rays once a day into the depths of the ulcer. Improvement was noticed at once and a cure resulted in four weeks. The cure of almost all local superficial infections, by concentrated rays of any kind, would seem to indicate that the proliferating parasite is killed by a degree of exposure which is perfectly harmless to the tissue cells.

The sensitizing of tissues by painting them with a fluorescent substance to develop more rays in the tissues, under the influence of light or röntgen rays, has been practised by very many surgeons. It is called Tappeiner's treatment in Europe and is described by Jesionek (Münch. med. Woch., May, 1904). Unfortunately, Piffard, of New York, has shown that many of the substances used do not fluoresce at all. The statistics of the cases treated in this way do not prove that the method has any advantages; though Dr. Wm. Morton, of New York, believes that the results are decidedly better. Fluorescent rays are mostly green and yellow and have a minimum of actinic effect unless greatly concentrated.

**Germicidal Power of Red Rays.**—The lethal effect of sun's rays depends upon their frequency, yet all of them are deadly if sufficiently concentrated. Even red rays, which are the slowest, can thus be made effective. Dr. W. O. Motshan (quoted in Med. News, Mar. 11, 1905, from Arch. f. Kinderheilk.) reports the cure of a case of noma, in a boy of nine, by the continuous application, day and night for three days, of light from a 16 candle power incandescent lamp, at eight inches' distance, fitted with a red globe and a reflector. In three days pain disappeared and in 10 days half of the wound was filled with granulations. The necrotic area gradually cleaned and the patient was shown two months later apparently cured. Yet it is not at all certain that this result was due to the red rays alone, for ordinary commercial red glass

allows rays of other frequencies to go through also, though in less amounts than the red rays. The lesions of smallpox are said to be made worse by the short rays, so that if the patient is kept in the dark or only the harmless red rays are admitted, suppuration and pitting is not noticed. Physicians seem to have great success in the darkness of northern Europe but it is always a failure in sunny America. Piffard, of New York, in a personal communication, suggests that the reason for our failures is that commercial red glass is used, and in this southern latitude it transmits the actinic rays. Perhaps we might have more success by trying darkening the room completely and using a dim red lamp-light.

**Cancer and Other Skin Diseases due to Light.**—Sunburn and glacier burn are now proved to be due to the short rays, and mostly to the ultraviolet. They are not heat burns, at all, but allied to röntgen-ray and radium injuries. If the skin is not sufficiently pigmented, as in the case of blonds who have migrated too far south of their normal dark habitat in northern Europe, it is reasonable to expect numerous kinds of diseases due to the light. This has apparently been amply proved by Dr. Hyde, of Chicago (Amer. Jour. Med. Sc., 1906), who shows numerous cases thus caused and advances the theory that cancer may also be caused by excessive light on blond skins. From what is known of the relative immunity of dark skins to röntgen-ray injuries, and from the fact that röntgen rays do produce malignant cancers, there is no doubt of the correctness of Hyde's theory. Dermatologists and surgeons can clear up this matter by recording the relative pigmentation of the skins of cases of every disease. The eye and hair colors aid in determining the skin pigmentation, though the skin may be relatively devoid of pigment even when the eyes and hair are very dark. In Italians the reverse is found—very well-protected skins, but gray eyes and light hair.

Dr. M. B. Triller (La Tribune Medicale, Sept. 22, 1906) reports that the skin eruption of pellagra is made worse by sunlight and may even be caused by light, though it does occur independently. The disease is much worse in hot weather. In Hyde's article there is a wealth of information of a similar nature, and it all tends to confirm the European contention as to the smallpox eruption being due to light irritation.

**Pigmentation due to Actinic Rays.**—All the actinic rays, if not actually lethal, stimulate the pigment cells to greater activity. Tanning

is thus nature's protective response to an injury. Pigmentation, due to röntgen rays has been noted ever since they were first used and it so interferes with penetrability that greater doses are needed when repeated applications are to be made. Drs. A. Imbert and H. Marquis (Semaine Médicale, July 25, 1906) have reported several instances in which the pigmentation due to röntgen-ray applications has been exceptionally marked, the hair in the neighborhood even when gray has become colored. In some instances where the rays caused the hair to fall out, the new growth was perceptibly darker.

*The Treatment of Newgrowths and Local Infection by Radiations.*—The literature of the treatment of neoplasms and localized infections is so voluminous that a review of it is practically impossible. About the only generalization possible from the mass of more or less contradictory evidence is the fact that all the short rays, light, ultraviolet, röntgen ray or radium, are lethal to superficial parasites, and are specially lethal to embryonic or rapidly multiplying cells. Atypic cells are destroyed while the surrounding tissue cells are uninjured. Deep tumors cannot be reached. At the hands of Abbé, of New York, the effects of radium seem to be specially felicitous in superficial cancer even in cases which seem most unfavorable for any kind of treatment. Röntgen rays are useless after tuberculous glands have softened. Since all these rays seem to be stimulating in small amounts and lethal in excess, and since various kinds of cells are more resistant than others, and since, also, the dosage administered may be ineffective for one case and harmful for another, it is not to be expected that reports will agree. Holzknecht, of Vienna, one of the leaders in actinotherapy, reported (Arch. of the Röntgen Ray, May, 1905) that röntgen ray was the ideal treatment for the following skin diseases: Cancer, alopecia, mycosis fungoides, favus and ringworm, that it was probably not as good as the usual treatment for sycosis, acne and psoriasis, unsatisfactory in verrucæ and hypertrichosis, and produces only comparative improvement in scrofuloderma and lupus vulgaris. Trachoma has several times been reported improved or apparently cured both by radium and röntgen ray, but the matter is still *sub judice*. The therapy of röntgen rays was discussed at the Medical Association of Greater New York, March, 1906, and the general trend of opinion was in the direction of denying any therapeutic value to röntgen rays except in very superficial affections, such as lupus, epithelioma,

and ringworm. It was found useless in deep growths and in the numerous general diseases, such as Basedow's disease. Much stress was laid upon the fact that the rays are impartially injurious to all tissues and cause involution and atrophy or even necrosis, and that it was a risky measure with a small limit of safety. Tracy (N. Y. Med. Jour., Mar. 4, 1905) even used it on the head and spine in epilepsy, and reported improvements but the later histories are unknown, and Liebermann (Arch. of Physiological Therapy, 1905) reported improvement of the pains and incoordination in tabes, but not a cure. A series of papers read before the Section on Pharmacology of the American Medical Association in 1906 (Journal, Jan. 26, 1907) brought out the fact that the proper use of röntgen rays is a most complex affair, requiring men of special knowledge and skill. Otherwise the rays might do more harm than good. Improper usage is no doubt responsible for the discrepancies in the reports. It would almost seem that the dangers of the rays are so great that a special diploma or license should be required as a prerequisite to practice.

Radium is said by Zhirnoff (Russki Vrach, Aug. 20, 1905) to attenuate or destroy the virus of rabies, and is effective in recent wounds. Similar results have been obtained by Italian investigators (N. Y. Med. Jour., Nov. 4, 1905), so that there seems to be an advance in the treatment of this infection by actinotherapy. Rodent ulcers are also reported cured by radium (Archiv. Rönt. Ray, Feb., 1907).

*General and Local Anesthesia from Actinic Rays.*—Early Russian reports of the local anesthetic effects of concentrated blue, violet and ultraviolet rays have been confirmed by many other Europeans, though little is said in America, where it is considered more of an impractical matter. Redard, professor of medicine, University of Geneva, uses a 16 candle power electric light with a blue shade on which the patient fixes his eyes for two or three minutes, all other light being excluded by a cloth thrown over his head. Sufficient general anesthesia is produced for minor operations and he reports that red or yellow light will not cause this effect. Hilliard, anesthetist of the London Hospital, has tried the method (Arch. of Röntgen Ray, Aug., 1905) and obtained some success in 20 out of 32 cases. There was no general anesthesia or unconsciousness, but a temporary impairment of sensation in the head and extremities, permitting of minor operations. One cannot help doubting these reports, and explaining the results by ordinary suggestion. Indeed, the

whole subject of the psychic effects of the various colors is in so much doubt that reports must be received with great reserve.

The local anesthesia of light and ultraviolet, on the other hand, seems practical and is more or less used in Europe for minor complaints (Arch. Rönt. Ray, Jan., 1906) and its field seems to be quite extensive in inoperable painful malignant growths. It deserves more trial in America. In dental work its results are said to be good.

*Medical Anthropology and Medical Climatology.*—The increasing brunetness of the American population was noticed by anthropologists long before the present flood of brunet immigrants began. It has been due to the greater mortality among the blond type. There is, then, a vital relation of type to climate and the medical profession must investigate it. The first requisite is a study of the complexions of the healthy population, and the second in a record of those of the sick. Then we can determine what types are proportionately the most diseased. All statistics of morbidity and mortality should record the types, and these can then be compared with the healthy population. This requires the cooperation of anthropologists, climatologists, physicians, and the census bureau.

In the matter of the effects of light there is some attention being paid to it by the medical profession and the anthropologists, but the gathering of census figures on a large scale is so tremendously expensive an undertaking that the census bureau would naturally hesitate. Perhaps we might get records of school children, as Virchow did in Germany to the great enlightenment of science. It is really a part of vital statistics, anyhow, and the health authorities might take it up. If any particular disease is afflicting any one type, preventive measures can be devised to the betterment of public health. The physical characters of our patients must be recorded—height, color of hair and eyes, complexion, weight, head shape, etc. In time some one will study the data and deduce generalizations of great value.

The climatologists are the slowest to take up the study of light. Beyond some crude observations of cloudiness, we know absolutely nothing of the relative intensity of light in various parts of the country. There has been but little done abroad. Indeed there are no reliable instruments. Actinometers usually record the actinic effect on some one chemical and really measure only that particular effect—but that is better than nothing. The work has been planned in America by the weather bureau,

and the reports will no doubt be of extreme practical value to physicians.

A review of climatology appears in *Science* every little while, but it never mentions actinometry, as though nothing was being done at present at any other place in the world. A climatologist writes me to the effect that the idea that light is harmful is the result of the "disordered imagination" of a "mossback." Are Abbé, MacDougall, Finsen, Hyde, Piffard and the host of workers in this line all "mossbacks" afflicted with hallucinations? He said, "I have not read your book nor is there any probability of my doing so." The weather bureau was organized by an army surgeon, born in New York—Albert James Myers—and its wonderfully successful work is proof of his far-seeing wisdom, but he was pretty thoroughly ridiculed for it at first. In reply to my request to quote the above climatologist, he writes, "you have *not* my permission to quote me in any of your writings or hallucinations. I do not propose to assist in exploiting any man whose 'ego' and 'major' are so pronounced . . . it is apparent that you are the most ordinary kind of a notoriety seeker."

The medical profession must worry along as well as it can without the aid of this progressive, broad-minded, and genial weather observer. If he were a real climatologist he might help his own science along a little in this matter. There is evidently a great difference between men who are just able to read barometers and those who might be called scientists. The latter read new books, the former don't.

## RECENT EDITORIAL OPINIONS.

*Journal of the American Medical Association.*—MEDICAL EDUCATION AND THE STATE: The expenses of medical education have so increased in the last quarter of a century that they can be only partially met by the income from student fees and endowments. The attempt, therefore, to secure State aid by incorporating medical schools in the State universities, as is being done with the College of Physicians and Surgeons in Chicago and the University of Illinois, is a proper step toward raising the standards of medical education and the promotion of medical research.—QUALIFICATIONS NECESSARY IN THE USE OF WRIGHT'S OPSONIC THERAPY: The employment of sterile vaccines in the treatment of disease must remain for some time beyond the scope of the general practitioner. For not only must an exact etio-

logic diagnosis be made and the bacterium in question be isolated in pure culture from which the sterile vaccine is to be made, but also the injections of this vaccine must be graduated and controlled by the determination of the opsonic index, a procedure that requires special facilities, some skill and much time.—**CANCER CACHEXIA:** Contrary to most explanations for the cachexia of cancer is that of Hansemann, who believes that cancer *per se* does not cause cachexia, but that the anemia and emaciation are due to the involvement and consequent disturbances of function of important organs or to extensive infection and ulceration of the growth. These observations, in the light of the consistently negative results of investigations for a cancer poison, will do much to place cachexia in its proper place as a late symptom in cancer, and so mark a step forward in the early diagnosis of cancer.—**DR. CARROLL'S PROMOTION:** The recommendation by special Act of Congress for the promotion of Dr. James Carroll to the grade of major, in recognition of his work on yellow fever, meets the approval of the entire medical corps of the army as well as of the officers of the other branches of the service.—**THE INFREQUENCY OF TUBERCULOSIS IN LARYNGOLOGISTS AND LUNG SPECIALISTS:** Based on this observation, Saugmann, of Copenhagen, has opposed the theory of droplet infection and draws the conclusion that in healthy adults the inspiration of droplets containing tubercle bacilli is entirely, or almost entirely, free from risk so far as giving rise to tuberculosis is concerned. This conclusion is applicable to healthy adults under all conditions and does not take into account individual resistance or the fact that not the healthy but those with predisposing factors contract the disease. Despite this observation, droplet infection probably does play some part in the transmission of the disease.—**IMMIGRATION AND INSANITY:** Among those certified as insane at the immigration headquarters there is noted a great predominance of young insane. Austria-Hungary, Russia and Finland furnish fully 50 percent of the total, Ireland and Italy being next. Among the idiots, and mental defectives the Hebrews and Italians are in the majority. However efficient the medical inspectors, some of these defectives must escape their notice to become later an expense to the country. Many, too, of the foreign-born insane, become such owing to the stress of new conditions after arrival in this country. This all presents a problem of considerable future importance to this country.—**MILITARY EFFICIENCY AND THE MEDICAL SERVICE OF ARMIES:**

Germany and Japan have well demonstrated that proper medical conditions in armies in the field can only be brought about by having an adequate medical corps trained not only in the care of the sick but also in the prevention of disease under service conditions. The failure to pass the recent bill "to increase the efficiency of the medical department of the army" is therefore very unfortunate. The responsibility for this failure seems to rest with the Speaker of the House of Representatives who refused to allow the bill to come to vote after it had passed the Senate and been favorably reported by the Committee on Military Affairs of the House.—**THE "ALKALINITY" OF THE BLOOD:** As a matter of fact the reaction of the blood is not appreciably alkaline but appears so only in the reaction to certain indicators. The alkalinity of a fluid depends really on the number of hydroxyl ions free in it and the blood contains no more of them than does the purest distilled water. A method to measure this power of preserving a neutral reaction termed the "reactivity" of the blood has been recently described by Moore and Wilson. The chief result so far obtained by this method is that in cancer the basic reactivity (*i.e.*, the power to bind acids) is increased.—**THE INDUSTRIAL DEATH ROLL:** The United States in contrast to other European countries has no actual statistics on this subject, for the reporting of industrial accidents is not here compulsory. Such accidents are increasing and each year the public is forced to assume the expense of what, in many cases, is a useless and preventable sacrifice of life and productive ability. It seems reasonable, therefore, that the industries in which these calamities occur should help to bear their cost, a plan which is followed in every great industrial country save our own.—**ORIGINS OF TUBERCULOSIS:** According to Koch the infection is practically always due to inhalation of the bacillus, while von Behring holds that the disease is due to infection through milk and occurring mainly in childhood. Cornet, in a recent publication, adheres to the old view on account of the frequency of inhalation and retention of dust particles. This division of authorities shows that the exact mode of infection is not yet known. It also emphasizes the need of greater care in the food, habits, and environments of children and points out a field where the young American physician may attain fame and honor by original work.—**THE PHYSICIAN AS TEACHER:** It should be the duty of physicians to contribute whatever there is in the science and art of medicine for the general welfare. Lectures on

topics of hygiene and sanitation are being given in many of the large cities and with considerable benefit to the general public. Only by such a system of sensible education can the tendency to the many "faith cures" and other charlatanries be overcome.—**SCIENTIFIC WORK IN THE PHILIPPINES:** The fifth annual report of the Bureau of Science of the Philippine Islands indicates considerable advance in scientific research in that country. In biology the preparation and use of cholera vaccine has given good results in protection from cholera. Important work has also been done on the rinderpest serum, amebic dysentery and beriberi. In botany important results may be expected from the study of the timber and plant products of the islands.—**MILK AND TUBERCULOSIS:** The Germans, following the ideas of Koch expressed at the International Congress on Tuberculosis held in London, in 1901, lean more generally to the idea that human and bovine tuberculosis are caused by different bacilli and that bovine tuberculosis is only slightly, if at all, transmissible to the human subject. The British and American investigators, as a rule, support the idea that bovine tuberculosis is transmissible to man and largely through milk. The reports from recent commissions or investigators give additional support to the latter view. The danger, however, must not be overlooked of infection by inhalation or by contamination of food and drink by the human tubercle bacillus.

**The Boston Medical and Surgical Journal.**

—**THE LABORATORY IN PRACTICE:** Dr. Edward L. Trudeau has shown that accurate laboratory work may be done in the face of difficulties and without previous training. So that the excuse of the practising physician that he has neither time nor skill for laboratory work falls to the ground. The results of laboratory examinations properly correlated with the clinical findings should aid materially in reaching more accurate and exact diagnoses.—**INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY:** The twelfth annual meeting of this association will be held in Berlin during the fall of this year. At the last meeting an invitation was extended by the United States to the Congress to hold its next meeting in Washington and it is hoped that favorable action will be taken at the coming session. The United States is now taking a prominent part in international affairs and particularly in those relating to public hygiene.—**FACTORY INSPECTION:** A bill is now before the Massachusetts State Legislature to transfer certain powers and duties of the inspection department of the district police to the

State Board of Health. This attempt to place in the hands of men, expert in hygiene and modern sanitation, matters of such importance must be followed with beneficial results to all concerned. There is need of systematic development of this branch of industrial hygiene, of a revision of the list of dangerous trades and the specializing of more men in sanitary work.—**THE AMERICAN CLINIC:** Owing to the different lines of development of the German and American clinics the latter offer less opportunity and incentive for medical research than do the German clinics. This rests largely on the independent development of the medical school, the hospital and the university in America, so that the university spirit of research has not been felt in the medical school. The union of these three is gradually taking place, and with it an increase and enlargement of successful research work with its good effect on the development of medicine.—**SOCIAL WORK AT THE MASSACHUSETTS GENERAL HOSPITAL:** This work, started by Dr. Richard C. Cabot, is an effort to improve the social and general hygienic conditions of the homes of patients, especially of the outpatient departments. The work is divided into divisions and is in charge of a corps of workers. The results of the work have been so good that it is hoped it will soon be included as an integral part of the hospital organizations.—**PROCREATION OF DEFECTIVES:** A bill to prevent procreation of defectives is before the Indiana Legislature. Such legislation seems uncalled for and if enacted might lead to serious abuses. It would, on the other hand, probably do little toward accomplishing the results for which it is designed. Nature is the best safeguard for the public in these matters.

**Medical Record.**—**SEQUESTRATION ANEMIA IN SURGICAL OPERATIONS ON THE BRAIN AND SKULL:** Sequestration anemia produced by the collection of the blood in the extremities by means of tourniquets properly applied lowers blood-pressure, withdraws blood from the field of, operation, and, instead of contributing to the production of shock furnishes a supply of blood to be let into the circulation should shock occur. On account of the danger of thrombosis and embolism the method is contraindicated by the recent occurrence of typhoid fever or puerperal sepsis, chlorosis or severe anemia of any kind, the presence of lime salts in excess or atheroma of the vessel walls.—**THE EFFECT OF A SALT-FREE DIET IN BRADYCARDIA:** The complete withdrawal of salt from the diet in bradycardia will in many instances result in a return to the normal of the slow pulse. The change de-

pendes probably on the presence of an associated chronic nephritis and the consequent retention of chlorids when the patient is on a normal diet. According to a recent paper, this may be taken as an important support for the theory that the motor impulse of the cordiac contraction affects the myocardium without the medium of the intracardiac nerves, for by the retention of chlorids the myocardium is bathed in a hypertonic solution which interferes with its proper functions, and by withdrawal of the salt the correct physiological tone of the muscle is restored.—**THE LOWERED BIRTH-RATE AMONG PROSPEROUS NATIONS:** A lowered birth-rate would seem to go *pari passu* with an increase of material prosperity and with a high degree of mental culture. In France, Great Britain, Germany and America this is true. Russia and other more or less primitive countries continue to add to their population at a rapid rate. The question as to whether it is well that races like Great Britain, in a country of limited area and with an overflowing population, should increase and multiply freely is a debatable one, though restriction of child bearing by artificial means is to be condemned.—**THE FERMENTATION TEST FOR DRINKING WATER:** The impurities which render water dangerous to health are derived principally from human feces which contain, beside the specific pathogenic organisms, great numbers of the *Bacillus coli*, so that the presence of this organism may be used as an indication of pollution. A method based on the property of the *Bacillus coli* to ferment sugars has been proposed which is simple, easily performed and gives reliable results.—**SULPHUR IN THE TREATMENT OF MALARIA:** A recent communication calls attention to sulphur inhalations as a prophylactic and curative measure in malaria. The sulphur inhaled as sulphureted hydrogen or sulphur dioxide forms with the hemoglobin sulphomethemoglobin which is exceedingly stable, and this may be the important factor in resisting the disintegrating properties of the malarial parasites. These observations should stimulate further research.—**THE CAUSE OF DEATH IN ACUTE DISEASES OF THE PANCREAS:** According to Guleke and later, von Bergmann, the pancreas as it undergoes necrosis in the body elaborates a toxic substance which is capable of causing death. It seems immaterial whether the pancreas of the experimental animal itself or one from another animal introduced into the abdominal cavity undergoes necrosis, or whether the organ be previously diseased or not. The interesting fact is also brought out that this autointoxication can be

prevented almost entirely by the previous injection of trypsin. This may come to be of use in the treatment of acute pancreatitis.—**THE EVILS OF EXAMINATIONS IN MEDICAL EDUCATION:** In a recent lecture given in London, Dr. Shaw emphasized the blighting influence of the examination system on both teachers and pupils. He would replace the present system by one of inspection and by records of work done by the student.

**New York Medical Journal.**—**THE ECONOMICS OF THE GENERAL PASTEURIZATION OF MILK:** Evil conditions do prevail in the milk supply of New York, but not to the extent that is stated by the advocates of this special remedy. A considerable percent of the milk even now is produced and distributed under strictly sanitary conditions. The suggestion, therefore, of general pasteurization would be a retrograde proposition and would set at nought what has already been accomplished, for the dealer with properly equipped dairy would either withdraw from the New York market or give up his sanitary equipment and put himself on a par with the careless, shiftless, unclean dairyman. The financial difficulties in the way of carrying out universal pasteurization, together with the inconvenience and loss to the dealer and the objection of the customer to the altered taste of the milk and the loss of the morning cream, all unite to make the scheme an impracticable one. It has been shown, too, that the use of pure sanitary milk gives even better results than does that of the pasteurized article. Universal pasteurization is, after all, a makeshift, is impracticable, and does not strike out the root of the problem. The section in public health of the New York Academy of Medicine has passed resolutions against this measure.—**THE PARANOIA QUESTION:** In former times paranoia included any of the delusional mental states especially if of a persecutory nature. Later the term became more restricted and the "paranoid group" as now recognized may be divided into three heads: 1. A rudimentary or abortive type including mild insanities developing on a psychopathic basis and in which various "phobias," fixed ideas and sometimes delusions of persecution are features. 2. The secondary paranoias including posttoxic and postinfection forms with the persecutory states seen in the alcoholicist, morphinist, and cocaineist. 3. The primary forms originating on a psychopathic basis characterized by the development of delusional systems in the face of relative clearness. In this class are also included the chronic delusional insanities seen in regi-

cides, reformers, insane religious teachers, etc.—**ETHYL CHLORID AS AN ANESTHETIC:** Ethyl chlorid induces anesthesia pleasantly and rapidly, the recovery of consciousness is prompt and the nausea and vomiting slight. On the other hand, muscular relaxation is often difficult to obtain and the deathrate is somewhat higher than that from nitrous oxid. Like chloroform it paralyzes the heart muscle and relaxes the arterioles, but in both cases the amount required to bring about this result is much greater. The rational method of administration would be to employ a gasometer and to administer less than ten percent of the anesthetic, which should be well mixed with the air.—**CHLORAL HYDRATE IN SCARLET FEVER:** Royer, at the suggestion of Dr. James C. Wilson, of Philadelphia, has reported the results of treatment in 800 cases in the Municipal Hospital of Philadelphia. The drug is given in sufficient doses to produce light somnolence and is continued for five or six days after the subsidence of fever. There is an amelioration of the nervous system, a relief of the annoying itching and a lessening of the tendency to postfebrile nephritis, but no particular increase of diuresis as claimed by Dr. Wilson.—**PECULIAR IDEAS ABOUT SMOKING:** The ideas concerning tobacco smoking recently put forth by Wikulill are based on rather insufficient ground. He is probably correct in saying that the sickness of the novice is not due to nicotine but to certain products of combustion. He seems to place too much importance on the injuriousness of inhalation, for smoke thus inhaled seldom gets beyond the larger passages. He also states that desiccation of the empyreumatic material drawn into the stem makes it more poisonous, but gives no good reason for such an idea.—**THE HEALTH OF THE CANAL ZONE:** During December, 1906, of the 8,200 white employes of the Isthmus Canal Commission on the Isthmus of Panama, there were only eight deaths. There was no quarantinable disease of any kind on the Isthmus. There was less pneumonia than during December of the previous year. Tile drainage is being established to prevent the development of anopheles and stegomyia. Efforts are being made to prevent the occurrence of typhoid fever by the posting of polluted streams, the installation of pipe lines from a safe water-supply and the prevention of contamination of reservoirs by continuous patrols, all of which is very creditable to Dr. Gorgas' administration.—**THE USE OF RONTGEN RAYS IN DISEASES OF THE BLOOD AND ALL OF THE BLOOD-MAKING ORGANS:** According to Pancoast only a small percent

(6.53) of cases of leukemia remain alive and well three to six years after the first symptomatic cure. The röntgen ray is not a specific therapeutic agent in leukemia, as it does not destroy the causes of the disease and acts by destroying the leukocytes and abnormal deposits of lymphoid tissues by stimulation of an autolytic process. Of the patients with pseudoleukemia, 27.6 percent remain alive and well three to four years after the first symptomatic cure. Here there is no evidence of excessive destruction of tissue. In serious diseases röntgen-ray treatment should always be controlled by studies in metabolism, the danger signals being the evidence of nephritis before treatment and a diminution in the output of uric acid after treatment.—**ESTHETIC ALIMENTATION, DINING AND ITS AMENITIES:** A book recently published by the Rebman Company well emphasizes the esthetics of eating and drinking, with special reference to formal dinners. A proper table display not only aids digestion but furthers concord and general good feeding.—**THE EXCITING CAUSES OF MALARIAL ATTACKS:** LeRoy, in a recent work, has explained the resistance of the healthy body to the malarial parasite as dependent on protective reflex phenomena consisting of continuous undulatory contraction of certain bundles of unstriped muscular fibers. The morbid manifestations of malaria then are directly dependent on conditions which interfere with this property of the muscular fibers. They are (1) meteorologic variations, (2) the absorption of toxic gases coming from decomposing vegetable matter, and (3) fatigue or nervous depression, all of which are known to affect reflex muscular contractions. This represents some of the valuable work being done on the predisposing and contributory causes of disease.

**St. Louis Medical Review.**—**THE TRANSMISSION OF DISEASE THROUGH DOMESTIC ANIMALS:** Some recent experiments have an important bearing on this question. Pure cultures of various pathogenic bacteria were scattered through the hair of animals and tests made to recover the organisms after varying periods. Typhoid bacilli were recovered after 16 to 17 days, diphtheria bacilli after 15 to 24 days, *Bacilli pyocyanei* after 16 days and anthrax bacilli after over two months, thus attesting to the part domestic pets may have in the spread of various infectious diseases.

**The Pennsylvania Medical Journal.**—**DR. DIXON REAPPOINTED:** The reappointment of Dr. Samuel C. Dixon as Commissioner of Health of Pennsylvania is a just recognition of the valuable work he has already done. He has been

especially active in his crusade against typhoid fever by preventing pollution of streams used for water-supply, against diphtheria by the use of antitoxin and against smallpox by insisting upon universal vaccination.

## NEWS AND NOTES.

**The Association des Anatomistes** held its ninth annual meeting this year at Lille from March 24 to 28, under the presidency of Professor Hallez. The vice-presidents are Professors Debiere, Curtis and Van Gehuchten.

**The Portuguese National Antituberculosis Congress** held its fourth meeting at Oporto from April 4 to 9. An exposition of hygiene, particularly intended to illustrate the means available for the prevention of tuberculosis, was held in connection with the congress.

**Disease with Famine.**—Scurvy is making great strides in the famine districts. The official reports for the second fortnight of March show 1,055 cases in Ufa Province and 717 in Saratov, compared with 438 cases in Ufa the first fortnight of March and 356 in Saratov Province during the same period. There has been a slight decrease in the spread of typhus. The project to transfer the famine relief from the government to the Zemstvos has been approved by the cabinet and will be submitted to Parliament.

**New lodging house rules** have been recommended by the Charity Organization Society and the Association for Improving the Condition of the Poor. If enforced they would make New York lodging houses the best and cleanest in the United States, and as good as those in England. The new regulations are commended because they are specific. They would reduce the number of persons in public institutions or applying for charitable relief, as the places where a great multitude sleeps would be less debilitating and disease-breeding. By bettering conditions they would diminish the tendency of lodging houses to become headquarters for crime, because the poor man, whose only offense is poverty, would not be compelled to spend his hours of rest amid degrading surroundings. In Manhattan and Brooklyn the number of recognized lodging houses is 130, with a nightly population of from 20,000 to 30,000.

**The twenty-fourth German Congress of Internal Medicine** is held this year at Wiesbaden from April 15 to 18, under the presidency of Professor von Leyden.

**National Quarantine in Louisiana.**—Dr. J. H. White, the United States Marine-Hospital officer who directed the campaign which stamped out yellow fever at New Orleans in 1905, has received his appointment as supervising inspector of maritime quarantine in Louisiana, Mississippi and the Central American fruit ports from Surgeon-General Wyman, of the Marine-Hospital Service. His appointment inaugurates the national quarantine in Louisiana, supplanting the State system, which has been in vogue for many years.

**Recommended for Massachusetts Tuberculosis Commission.**—The State commission which has been investigating the treatment of tuberculosis in Massachusetts has filed its report. It calls for the establishment of three hospitals, each with a capacity of at least 150 patients, and to take in advanced cases if necessary. It also provides for paid agents to investigate the matter of tuberculosis and for compulsory notification of local Boards of Health.

**To Make Nutrition Tests.**—The Executive Committee of the Carnegie Institute has decided to establish in Boston a laboratory for the purpose of conducting experiments in nutrition. An appropriation of \$100,000 is allotted for the erection of a building and a large sum is to be devoted to the scientific investigations of the nutritive value of various kinds of food under the direction of Professor F. G. Benedict, of Wesleyan University.

**The death of Professor Ernst von Bergmann** occurred on March 25. He had suffered for some time intermittently from symptoms of abdominal disease. At his own request he was operated upon twice, but did not rally from the second operation. He was unquestionably the foremost surgeon of Germany, and only recently celebrated his seventieth birthday.

**An Argentine Society of Sanitary and Moral Prophylaxis** has recently been founded for the prevention of syphilis. Its headquarters are at Buenos Ayres. The president is Dr. Emilio R. Coni.

**Professor Ernst Haeckel** a week or two ago celebrated the golden jubilee of his graduation in medicine. In honor of the occasion he was made a Privy Councillor, with the title of "Excellency." He is 73 years of age.

**The tuberculosis sanatorium in Porto Rico**, founded by the Antituberculosis League of Porto, Rico was dedicated April 5. The Insular Government and the city of San Juan together give \$700 monthly toward the support of the institution and funds are also received from private sources.

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# American Medicine

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**The defects in the plan of organization of the American Medical Association** are few, but are becoming apparent through the experiences of five years' trial. They must be remedied, and soon, by those within the organization or they will be seized upon by its enemies and those of the profession. When criticism is rife it is shortsighted and foolish to think that betterment is impossible. It is a sorry blunder to oppose discussion of weakness, to claim infallibility in conception or execution. If plasticity is lost, growth and progress are stopped. Criticism within the ranks is usually by minorities; progress is initiated by the few. The movement for the unification of the profession had its rise with a very few men, of constructive statesmanship, who worked for the establishment of an *esprit de corps*, the raising of professional standards, the increase of scientific work, and through these the advancement of the higher humanities. The profession would benefit by demonstration of its solidarity and by protection against exploitation for commercial or political advantage.

**The evils of too much officialism** are recognized generally throughout the profession, and protest is common. It can be given no clearer utterance than in the recent address of President-elect Bryant before the united medical societies of the State of New York. Note these ringing words concerning the dangers of paternalism: "It would be sadly amiss, indeed, were I not to ad-

monish you at the opening of a united career, of the grave perils begotten by the spirit of paternalism which, not infrequently, is a pernicious by-product of organized power. The seductive and oppressive influence of this spirit often usurps, and may inhibit that nobler, more enduring, and beneficent one, characteristic of common manhood and of professional brotherhood. In this relation it should not be forgotten that the greater and more extended is the membership of a fraternal body, the greater and more extended its constituent paternal desires are apt to be. Consequently, the longer the chain of affiliation is, the weaker it may become; for, as you already understand, no chain is stronger than its weakest link."

**Centralization of power means opportunity for corruption** by concentration of temptation. It is alleged that the American Medical Association in its present form is simply an elected autocracy instead of the republican institution planned. Office too long held and without proper restriction may come to be regarded as a vested right. Large bodies are proverbially inert and individuals are prone to seize advantage. Criticism thus far is largely confined to the existence of possibilities. There seems as yet no belief in much wrongdoing, nor widespread distrust of individuals. Yet thoughtful men are beginning to recognize the possibility of abuse because too much is trusted to the altruism and honesty of

officials and so-called leaders. Too often the politician benefits chiefly or alone by what the statesman has built up. When power is vested in the hands of the few, who may use official positions for private advantage, corruption and graft are more than possibilities. In any governing or legislative body honesty and identity of interest will inspire true representation. But when that body is uncontrolled save by periodic elections, and is without direct recourse to popular endorsement or reversal of particular acts, the representatives are free to legislate in their own interests collectively or individually, or in the interests of others who furnish sufficient inducements. The duty and the self-interest of functionaries do not always agree, and self-interest has many disguises. In office, when possibility of revision of their acts is negligible, good men are difficult to keep good.

**The provision of the referendum** in the constitution of the American Medical Association was intended to protect the members against these possibilities, but in its present form it is inadequate. It is optional instead of obligatory; it is legislative only, there being no provision for reference to popular vote save upon the initiative of one or the other general body of representatives; the proportion of votes required to obtain the referendum is too great; no provision is made for general secret vote on the part of the members of the Association. Instead of self-government, the members of the Association possess only the privilege of electing their governors—the delegates—and through them the trustees. If wrongly represented by any official act there is no recourse other than to elect other governors at certain specified times. True, these delegates and trustees are supposed to be men of self-sacrificing spirit, who serve without

recompense or personal advantage. Yet there seem to be evidences that the fine Italian hand of the politician has been at work. Why has work for self-election as delegate been so industriously prosecuted in more than one section and State society? A certain trustee, whose special work has seemed to lie in directing policies, financial and otherwise, of the Association, is said to have spent in visiting delegates much of the three months preceding the meeting at which his reelection or the election of his successor was due—"mending fences" is the political phrase. Perhaps his action was ruled by altruism, not love of power. But the power nevertheless is his for the full term of his reelection.

**The rights of individuals in professional organizations** are strongly upheld by the vast majority of the right-thinking men of the profession. Their beliefs are ably voiced by President Bryant, who thus warns and advises his professional brethren: "Kindly permit me to admonish you to be steadfast and diligent in the preservation and development of the State organization as at present constituted. It is a free government in the complete sense of the expression, one in which the humblest members of the most cheerless stations of the State have equal privileges with those of exalted station in the midst of wealth and power; one in which the officers are your servants and not your masters, unless *you* so will it to be, and from whom you have the right to demand at the proper time, and in a suitable manner, a complete accounting of the status of their respective stewardships, and which, when wisely required, they have no right to decline. And in all other respects, your rights and privileges cannot be overshadowed by those of another unless you, yourselves, lend aid to the eclipse."

**The Establishment of the Principle of Self-government is Necessary.**—In spite of the natural conservatism of medical men, there is a growing discontent, a feeling that the real sentiment of the profession is not truly represented in the increasing tendency of the "leaders" toward mere money-getting, monopoly, and trades-unionism. This discontent is not reactionary but constructive. It demands the retention of all the advantages obtained through the late reorganization and the adding of others to make these more effective and more truly representative. President Bryant expressed this feeling of the profession admirably when he recently said: "If on our part, a spirit of fraternal oppression of any kind should develop as the outcome of organized strength, then indeed will the day of consolidation become one of mourning for the loss in fraternal fellowship and in professional station, instead as it ought, a day of rejoicing because of the great opportunity for general good thus brought into existence."

**Important Matters of General Policy Should be Referred to the Body of Members of the Association.**—The vast equipment of the Journal and the Association can be economically used to this end, each member being afforded opportunity through his district or county society to record a secret ballot giving his judgment. A petition signed by 500 members of the Association or five percent of either the House of Delegates or the General Session should ensure reference to the general ballot. Save in emergency cases, this may be deferred to times when several matters can be acted upon together, or at certain fixed periods of the year. The spirit of fair-play which animates the profession as a whole may be trusted to prevent injustice and reach a gen-

eral rightness. No better curb upon extravagance of either power or expenditure can be conceived. There is danger, under the present organization, of the plenary powers of the trustees being regarded as proprietary rights. These nine men (with the President and Secretary) may divert portions of the vast accumulations possible under the present policies to ends not in accord with the original aims of the Association nor thoroughly representative of the great body of the profession. One may instance such steps as entering into competition with publishers of books or with the manufacturers of drugs, in the name of the Association and by use of its funds. The real aims in such measures may be masked by a specious plea for purity and professionalism. Even the admirable Council of Pharmacy might be made to further such schemes by clearing the field of competitors.

**The Journal is the property of the members of the Association,** not of its trustees or officers. It must therefore be conducted in the spirit of the profession at its best, not as may seem good to any individual or coterie. Much of the danger of misrepresentation of the will of the general body of the Association and of the profession is particularly possible with regard to the official organ of the Association. There should be the utmost freedom of discussion in the pages of the Journal of all matters relating in any way to the interests of the profession. This should apply especially to the proceedings of the House of Delegates, which should be published verbatim. The most obscure member of the Association, who cannot afford to leave practice and spend money to be present at the deliberations of his representative body, is entitled to know not only what scientific work has been done at the annual meeting, but also

in what manner its financial affairs are conducted, what affairs come before its legislative sessions, the matter and manner of debate, and the votes recorded on any subject.

**Every Constituency is Entitled to Know How Its Representative Represents.**—Concerning this contention President Bryant has nobly said: "Since 'every rose has its thorn,' it should not be overlooked at this time that the flowery probabilities of mutual scientific medical journalism might easily be inhibited, and even destroyed by the thorny possibilities of selfish time-serving desires. In any event, common justice demands that all questions of mutual, material interests, and others of general interest to the profession of the State, should find free and impartial utterance through the pages of its own journal. The presence of a spirit which contemplates that the entire membership of the profession of this State be not made familiar by its own servants with the facts relating to the respective differences in all matters of common importance, is offensive to the principles of American institutions, and to those of fair dealing in all lines of manly action." . . . "The fact that each member of the organized body has rights in the publication equal to those of another, would seem to inspire sentiments of mutual interest and fidelity, resulting in a more extended and higher standard of professional fellowship, than sometimes appears to exist. And, too, the united voice of the profession can be heard through the agency of the Journal, with a clear unhindered emphasis on all matters relating to common professional and common public betterment."

**The Powers and Functions of Certain Officers are too Great.**—This applies not only to elected officers, but to those ap-

pointed by the trustees. Of the five lucrative offices at the disposal of the Association, four are assigned not by the members of the Association, nor even by their representatives in the House of Delegates, but by the trustees. And these functionaries are directly accountable to the trustees alone. Two of these officials, the Organizer and the Advertising Manager, each hold but one office. The other two, General Business Manager and Editor, the most important, are represented by one individual, who also combines with these appointive offices the elective position of General Secretary of the Association. From the standpoint of power and opportunity, the secretaryship may be made far more important than the presidency, which can be held for one year only. In times past presidential communications have been received with the proper residential date line but bearing a Chicago post-mark several days later. This would seem to show that certain Presidents may acknowledge the supremacy of the Secretary—or the Editor! By a curious oversight the Secretary, the Editor, and the General Business Manager each forms a strong factor in the bodies governing his actions, compensation, policy, etc. It is stated that the incumbent of these offices is present at all the meetings in an attitude of practically determining all decisions. When the Association had only 10,000 members this concentration of office seemed a measure of economy both of money and effort. The Association has outgrown any possible benefits of such an arrangement. It has begun to suffer from its evil possibilities. Each of these offices must be filled by some man particularly fitted to discharge its duties, or worse will come. The Association has sufficient wealth at its command to obtain the proper men and to compensate them worthily. No one man can by any gifts of nature or

acquisition properly perform these diverse duties. That the present able Business Manager has so long filled the two other important offices is far from creditable to his employers. He should be continued as Business Manager at a liberal salary; the Association might even afford to pay for the one office the sum this functionary has been receiving for the combination position.

### **The Duties and Functions of the Editor of the Journal Must Be More Clearly Defined.**

—He cannot be, in any sense, "independent," nor can he have discretionary power. The Journal must mirror the sentiment of the Association as a whole, but must give due representation to minorities. The unknown and presumably unimportant member is as much the owner of the Journal as any elected or appointed functionary. It is impossible to "divorce the Journal and the Association." The strictest justice and impartiality must be the only policy of both. Personal judgment and the gratifying of private piques are indefensible. To this end, although the Editor should have absolute freedom of literary revision, the right of determining the scientific and other contents of the Journal must rest with the sections and the Association. These requirements emphasize the necessity of high literary and professional attainments for the Editor of the Journal. He must be scholarly. He must be able to assist contributors to clothe their contributions so that through its Journal the work of the Association may be properly presented. He must be identified with the highest professional standards, the most progressive thought, and must have the judicial faculty of impartiality. The Editor is not required to give *ex parte* judgments upon either matters of science or ethics, nor to instruct in matters of duty. No member of the Association should be

humiliated by refusal of admission to the pages of the Journal by the judgment of one man or several as to the scientific value of his communication. Nor should he, by one man's decision, or that of a small committee, be advised to withdraw "for his own good" or because his "motives are open to suspicion." Courtesy and consideration without arrogance must rule in all editorial communications; at least until omniscience is really an editorial attribute.

**The Secretary of the Association** represents the Association most peculiarly, not alone to individual members, but also among the scientific bodies of the world. He should be a gentleman in the best sense of the word, fitted by professional and general training and education to meet the highest and the most humble worthily. He should possess an agreeable and magnetic personality, and be imbued with professional ideals. He must be able to inspire respect for the Association he represents because he represents it with dignity and honor. If any two offices in the gift of the Association can be fitly combined, those of Organizer and Secretary are the two. The office of Organizer has been regarded as temporary, but, if the Association is to continue to grow, many of the duties of the office will remain permanently. The two offices require the same type of man. Their duties are sufficiently similar to enable a profitable consolidation. There should be regular itemized reports of the constructive work done by this Secretary-Organizer. This will enable the Association to judge of the possibility of further development and adjustment. This office, as well as that of Editor, should be well paid in order that the best talent may be obtained. The Association can afford to appropriate at least \$25,000 to divide in salaries among its Editor, Secretary-Organ-

izer, and Business Manager. The increase over the salaries now paid would not be exorbitant, and would be a small price to pay for the increase in efficiency and the better standing of the Association among similar bodies.

**Constituent Ownership Should be the Key-note of Both the Association and its Journal.**—That the Journal of the Association no longer represents the policy of the Association save so far as its policy and that of certain officials coincide is well known. Representation in the Journal has been denied time and again to those who

venture to disagree with the sentiments and policies of those who constitute themselves the court of last appeal. It is stated that threats even have been used that the whole power of the Association Machine would be brought to bear against a recalcitrant, to insure his humiliation and disgrace, unless he would forego the publication of his side of the case. Power to exclude a fellow-member of the Association from any of its rights and privileges must be carefully withheld from any functionary or set of officials. It was with reference to such possibility that President Bryant recently said: "The editorial policy of a journal of constituent ownership, like this of ours, should be guided by the composite wisdom of an impartial committee chosen for the purpose, rather than by the notions of the editor himself, as in the instance of personal proprietorship. Prompted by this belief the president declined to appoint on the publication committee the editor of the Journal. In my opinion, the salaried agents of the society ought not, for apparently obvious reasons, to be entitled to membership in the executive bodies which regulate their compensations or determine their policies of action. Other and wiser means of conference

than this can easily be determined." And again: "I am clearly of the opinion that the net earnings of the Journal should be utilized for its betterment, and for the purpose of extending, when feasible, publication courtesies to such of those as contribute to its pages important and original articles. It should not be the policy of this Society, in my judgment, to accumulate worldly belongings, but instead to increase the wealth of good fellowship and professional advance, by a wise adjustment relating thereto of its business management."

**Independent Professional Medical Journals are more Peculiarly Representative of the Profession than are Society Organs.**—Any attack upon their existence by organized power is a direct blow at the profession itself. To them, more than any other agency, has been due the development of the movement toward solidarity, as well as the advance of science or reform. The initiative has always been theirs, and, so long as progress springs from the work of the few instead of from the work of organized bodies, they will be needed that growth may come. They alone can represent independent thought, or exercise the wholesome function of disinterested criticism. Yet under present conditions, it is in the power of a few men in the Association, by employing the competitive methods of a monopoly, to make the existence of independent journals impossible. These journals may be threatened with the boycott unless they are entirely subservient to those controlling the Association. They may be crowded out by unfair competition in the advertising field, or by pressure exerted in various ways; for example: By the Association and State journals adopting rates proportionately so low that journals unsupported by organization fees will be unable to compete; by using the

organization as a club, "blackmailing" the advertiser in a cunning way to secure patronage for the organization journal and bar out a rival; by the organization journals taking advertising until proved unfit, and claiming the right of such proof under control so that none may say conclusively that exclusion and ability to dispense with such revenue are coincident. Unfair competition may also exist in the matter of literary and scientific material. Efforts may be used to secure for organization journals literary and scientific material not constructively nor in any sense justly to be claimed by them. Yet these journals are frequently unable to publish fully their own transactions for "lack of space!" Authors may be shown that unless their articles are published in these organization journals they will, so far as possible, be denied quotation and reference in their pages. It is publicly stated that all these methods have been employed in concerted attack, both open and secret, upon independent medical journals of high professional standing.

**Trades-union methods** are not in the spirit of the profession. They have been initiated and carried out by the few for self-aggrandisement directly, or indirectly by means of the accumulation of a large surplus. They will ultimately be condemned by the great body of the profession, but this should be done while prevention of ill-effects is still possible. It is unseemly that organization journals should carry any advertising which they may be compelled at any time to exclude or denounce. Nor should the organs of professional scientific bodies act as the mouth-piece of manufacturing or publishing firms. Higher ethics would dictate that they devote themselves to organization and professional matters, and publish no advertising. Particularly is this true if re-

form in advertising is to be carried out through their agency, or by their attack. General confidence in the purity of their motives will never be felt so long as present methods prevail. President Bryant speaks of these matters in no uncertain terms: "Whether or not the medical journals which, for covetous business reasons, exploit remedial agents in a manner calculated to deceive the unwary, the unsophisticated and the indolent, are to receive professional support, will, as it seems to me, be determined more by the outcome of patiently developed, and higher comprehensive professional sense, than by other inhibiting influences."

**Reforms Demanded in the Interests of Progress.**—Briefly these may be summarised:

1. Verbatim reports of the proceedings of legislative and governing bodies.
2. Itemization and utmost publicity of financial matters.
3. Proper representation in the offices of Secretary, of Editor, and of Business Manager by separate individuals, with proper compensation.
4. Nondiscretionary power of the Editor, with government by the Sections of the published proceedings.
5. The rendering impossible of trades-unionism and monopolistic methods.
6. Provision for general secret ballots upon important questions of policy by means of the machinery of the Association and its Journal, through district and county societies.
7. The extension of the referendum and initiative from the optional legislative to the popular and obligatory form.
8. In order to protect apparent minorities, placing the vote necessary for both referendum or initiative upon a reasonable basis.
9. The rights of individual members must

be held inviolate from attack by those in power.

10. The Association and its Journal must be enjoined from entering into purely commercial competition to the detriment of its professional rivals.

11. No paid agent of the Association should be permitted to be a member of, or take part in the deliberations of, the bodies governing or directing his actions or compensation.

These reforms are demanded by a large and increasing body of the profession, among whom are many members of the Association, and not a few of its officers. They are here presented for discussion by the House of Delegates at the approaching annual meeting. May that body have wisdom sufficient for reform from within lest reform be forced from without.

**The Whistling Nuisance.**—In New York City by long and hard work with legal and governmental authorities one good woman has almost succeeded in breaking up the useless nocturnal whistling of tugs and other boats in the harbor. The right of all to sleep, the right of many to health, the right of the sick to be allowed to get well, were imperilled by the unnecessary whistling. In Philadelphia and in other cities the engineers of locomotives and switching engines of the railways are expressly forbidden to use the whistle in signalling, but, this nuisance continues. During summer nights when windows must be kept open this whistling becomes a health-wrecking agency which should be abolished. In any city there are many noise nuisances which cannot be abated either greatly or entirely. The terrible trolley car for instance is destroying the health of thousands, or killing them slowly and certainly, and the horns of the automobilist add to the din. But some noises are wholly unneces-

sary, and these, for the sake of their patients, physicians should unite to denounce and stop. Determined action by Medical Societies against the evil would be of great service to the community. The rich are in summer able to escape the pandemonium of our modern cities, but the poor and sick cannot do so. Let us help them to make their afflictions a little more endurable.

**Pauperizing the half-blind** is an unexpected result of the excess of charity thrown at the real blind. It is found that people who can see well enough to make a good living are gathered in with the blind, and in one school such boys are able to play baseball! The old conception of a "blind asylum" to care for the blind is now known to be thoroughly vicious. It presumes them to be helpless paupers, but the modern idea is to put them in the way of making their own living. Work was formerly considered an incidental but now it is an essential, for the afflicted are thereby made happier and healthier and more independent. Many become valuable members of society. A blind street beggar is an anachronism—he should be locked up and taught to earn his subsistence like men who are even worse afflicted than he. Hence, the acceptance of the half-blind into institutions and treating them as though they were wholly blind is not only injuring them but wasting public funds and donations intended to make others self-supporting.

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**The Headquarters of American Medicine** during the annual meeting of the American Medical Association, June 3-7, will be at The Chalfonte, Atlantic City, N. J.

## BOOK REVIEWS.\*

**Clinical Diagnosis.**—A textbook of clinical microscopy and clinical chemistry for medical students, laboratory workers, and practitioners of medicine. By CHARLES PHILLIPS EMERSON, M.D. J. B. Lippincott Company, Philadelphia and London.

Dr. Emerson justifies this latest addition to the long list of textbooks on clinical diagnosis by the assurance that it covers the ground in a different way, in that clinical laboratory work is considered from the clinical rather than from the laboratory point of view. Guided by this purpose, he has written a very instructive book of great practical value to the student and to the physician. To the laboratory worker it will also be an aid, although for him, as the author states, other books of reference will be necessary. For the teacher of clinical diagnosis we know of no more suggestive work. Based as it is upon the course given at Johns Hopkins, "the questions discussed are for the most part those asked by the students during the class-work," and this makes it distinctively a teaching book. For this reason it is also of value to the practising physician who seeks the explanation of necessary working details of clinical microscopy rather than complex methods which require a well-equipped laboratory for their performance. To summarize, Dr. Emerson has written a really serviceable book and for such, even with our multiplicity of textbooks, there is always room. With the kind of paper employed the 627 pages of text make a moderate sized volume quite in contrast with many of the ponderous tomes on this subject. The subject-matter of works on clinical diagnosis is so well known that it is not necessary to discuss them in detail in connection with this book. Worthy of special mention, however, is the chapter of 80 pages on the sputum, in which this subject is treated in an unusually satisfactory manner. The colored plates of blood cells and malaria parasites are good, as indeed are all the original illustrations. The book is under rather than overillustrated, there being 126 figures and five plates.

**A Textbook of Human Physiology.**—By DR. ROBERT TIGERSTEDT, Helsingfors. Translated from the third German edition and edited by JOHN R. MURLIN, A.M., New York. With an introduction by PROFESSOR GRAHAM LUSK. D. Appleton & Company, New York and London, 1906.

American students of physiology are indebted to Dr. Murlin for this presentation of a standard German work. The biologic introduction is a feature of note at the outset of the book. As stated by Dr. Lusk in the introduction, Tigerstedt is the author of a sterling monograph on the circulation, hence that subject in his physiology shows the treatment of a master. He also speaks from experimental knowledge in the discussion of metabolism. Of the 711 pages of text, 130 are devoted to the various

parts of the nervous system, a topic which is handled in the most complete manner. The book contains 305 illustrations, many of which are in colors. It is a very valuable addition to the list of physiologies available to the English-speaking physician and medical student.

**Modern Clinical Medicine.—Diseases of the Digestive System.**—Edited by FRANK BILLINGS, M.D. Authorized translation from "Die Deutsche Klinik" under the general editorial supervision of JULIUS L. SALINGER, M.D. D. Appleton & Company, New York and London, 1906.

This volume contains 786 pages of text on diseases of the gastrointestinal tract, the pancreas, and the liver and biliary passages. The 20 topics comprised in the contents are discussed by such men as Ewald, Boas, Oser, Minkowski, Vierordt, Hoppe-Seyler, and Nothnagel. These names are a guarantee of the value of the book which is almost purely a translation, the editor having made few additions or alterations in the subject-matter. As with most German works the references are almost wholly to German and French literature but the book is a satisfactory exposition of the views of men of whom many are the leaders in the subjects they discuss. The translation has been well done and the book is easily read. This is intended to be facilitated by italicizing important words and sentences but in some of the chapters this has been overdone and becomes confusing rather than helpful. Throughout the book special stress has been placed upon symptomatology, diagnosis and treatment, which make it of great value to the practising physician. Of the 45 illustrations, half are in the section on examination of the feces which is a very instructive exposition of this much-neglected means of diagnosis. This volume is a worthy member of a series.

**Surgical Suggestions.—Practical Brevities in Diagnosis and Treatment.**—By WALTER M. BRICKNER, M.D., and ELI MOSCHOWITZ, M.D. Surgical Publishing Company, New York.

An occasional glance at this brochure would probably whet the appetite but should not recommend it for a general diet. A meal made up entirely of spice quickly surfeits the appetite.

**Woman.**—By BERNARD S. TALMEY. The Stanley Press Corporation, New York.

The subtitle of this little book of 200 pages is "A treatise on the normal and pathologic emotions of feminine love." The author wrote it as the result of investigating the question of the sexual characters of women in order to answer intelligently the questions of patients, needed knowledge not supplied by medical colleges. He has given in a concise manner the knowledge obtained by long research in the literature of the subject and thus has produced a book that will be of distinct value to physicians and students of medicine. Too many books have been written on various phases of this

subject but there is need for just such works as this which is entirely devoid of sensational and suggestive statements. The whole trend of the work is that of an attempt to supply needed information. Both because of this attempt and the way in which it has been carried out the book can be commended.

**Diseases of the Stomach and Intestines.**—By BOARDMAN REED. Second edition. E. B. Treat & Company, New York, 1907.

In this edition new material has been added to 18 of the lectures. The author finds that the trend of practitioners is more and more toward certain views set forth in the first edition, though at that time they met with considerable criticism. This is especially true of the use of tuberculin.

**Midwifery for Nurses.**—By HENRY RUSSELL ANDREWS. Longmans, Green & Company, New York, 1906.

This book of 300 pages is made up of lectures delivered to the pupil-midwives at the London hospital. It is confined to practical points that nurses should know and is clearly written. Of special interest to English nurses is the chapter on the rules of the Central Midwives Board.

**Anatomy for Nurses.**—By ELIZABETH R. BUNDY, M.D. With a glossary and 191 illustrations. P. Blakiston's Son & Company, Philadelphia, 1906.

In this book of 250 pages the author has presented in a clear and concise form the essential facts of anatomy needed by the well-informed nurse. Frequently interspersed clinical notes add many points of practical value regarding the structures described and add to the value of the book.

**Syllabus of Lectures on Human Embryology.**—By WALTER PORTER MANTON. Third edition, revised and enlarged. F. A. Davis Company, Philadelphia, 1906.

This edition maintains the reputation of this little book as a practical guide to the study of obstetrics and gynecology. Our only criticism would be that the section on the anatomy of the female organs of generation is disproportionately long in a work on embryology even though the book is intended as an introduction to branches dealing specially with those organs.

**Indications for Operations in Disease of the Internal Organs.**—By PROFESSOR HERMANN SCHLESINGER, M.D. (University of Vienna). Translated by KEITH W. MINSARRAT, M.B., F.R.C.S., Ed. E. B. Treat & Company, New York.

This work is one of the most complete of its kind that this review has ever had the pleasure of reading. Most every conceivable topic in the domain of the internal organs and tissues has been touched upon. While little space is given to each diseased condition, the etiology and pathologic anatomy, it has been entirely subordinated to the main question of indications and contraindications for operation. The large experience of the author permits the in-

jections of his own individuality and ideas which add great value to the text. At the end of each chapter full reprints are given which are of value to anyone who wishes to make a deeper study of any one point. The work should be in the possession of every general practitioner. A careful following out of the author's suggestions would prevent the surgeon from meeting the condition "too late for operation." Addressed to the practitioner from a surgical standpoint, no fairer exposition of the subject has before appeared. The translator's work is to be highly commended, the English text running smooth, clear, and easy to read.

**Progressive Medicine.**—Edited by HOBART AMORY HARE, M.D., assisted by H. R. M. LANDIS, M.D. Volume VIII, No. 3, September 1, 1906; No. 4, December 1, 1906. Lea Brothers & Company, Philadelphia and New York.

Number 3 of this quarterly review contains articles on Diseases of the Thorax and its Viscera, Including the Heart, Lungs and Bloodvessels, by William Ewart; Dermatology and Syphilis, by William S. Gottheil; Obstetrics, by Richard C. Norris; and Diseases of the Nervous System, by William G. Spiller. Among the many interesting points taken up are the question of heart-block, and the relation of *S. pallida* to syphilis. Dr. Gottheil believes the facts regarding the latter indicate with a great deal of probability that this organism is the cause of the disease. He thinks, moreover, that while of the greatest scientific medical interest the discovery will not prove of much clinical value. As usual, this digest gives a very complete summary of the literature on the subjects discussed. Number 4 contains a digest of diseases of the digestive tract and allied organs; genitourinary diseases; diseases of the kidneys; anesthetics, fractures, dislocations, amputations, surgery of the extremities, and orthopedics; and practical therapeutic referendum. Steele finds that his statement of 1904 and 1905 that occult bleeding occurs in every stool in ulcerated cancer needs revision. Bloodgood regards Bier's treatment with hyperemia as a contribution of the greatest importance to conservative treatment but will not report on his own experience until next year. Landis states that nothing specially new in therapeutics has appeared during the past year but there have been many valuable suggestions in the treatment of disease. This number contains an exceptional amount of practical information.

**Rhythmotherapy.**—A discussion of the physiologic basis and therapeutic potency of mechanical vibration with a dictionary of diseases and detailed suggestions as to the technic of vibratory therapeutics. By SAMUEL S. WALLIAN, A.M., M.D. Quелlette Press, Chicago, 1906.

Mechanical vibration, while a useful therapeutic process, is incapable of doing one-hundredth part of the things this book credits it with. It is such sort of writing that hinders scientific recognition of the real but limited value of the method.

## CORRESPONDENCE.

### COMPARISONS ARE ODISIOUS.

BY

EDGAR G. BALLENGER, M. D.,  
of Atlanta, Ga.

*To the Editor of American Medicine:*—The following selections which I desire to call to the attention of your readers have been clipped from a paper on "Chronic Urethritis and an Improved Method of Applying Medication to the Urethra" by Dr. James A. Gardner, of Buffalo, N. Y., which was published in the *Medical Record*, December 22, 1906. I have placed some of the clippings in columns and beside them have arranged corresponding selections from a paper of mine with the same title which appeared in *American Medicine*, March 3, 1906. As regards the remainder of the clippings from Dr. Gardner's paper which have been taken from my work, it will be only necessary to refer to the subjects, since, so far as the human eye may detect, they are an absolute verbatim reproduction, and lack of space prevents my making use of them. Further, any one desiring to look into the subject can easily refer to the original papers. It will be noted that the following excerpts have been only accorded some slight rearrangement from my paper. Possibly even this was done by the different editor?

Beginning with and including pathology, diagnosis, prognosis, and treatment a matter of over 1,500 words additional have been copied verbatim; the conclusions as shown by the following clippings are almost identical.

*American Medicine*, March 3, 1906.

#### CHRONIC URETHRITIS AND AN IMPROVED METHOD OF APPLYING MEDICA- TION TO THE URETHRA.

BY

EDGAR G. BALLENGER, M. D., of Atlanta, Ga.  
Lecturer on Genitourinary Diseases, Atlanta School of  
Medicine.

[*Medicated sounds*] are of distinct value in treating [chronic] urethritis for the following reasons:

1. They are easy of application and combine more valuable features than any other single remedy. [2. A uniform application to the stretched mucous membrane is obtained.] 3. The ointment may be gently massaged into the follicles and recesses where the organisms are usually protected from treatment or the urinary stream.

5. In case [there is] a stricture in the formative stage from a granular patch or from a localized inflammation, this is the treatment [*par excellence*] for curing the discharge and removing the shreds, as well as preventing organization of the exudate and the formation of a stricture by its prompt absorption. 6. If a stricture has already formed, the dilation, with a local application to the mucous mem-

*Medical Record*, Dec. 22, 1906.

#### CHRONIC URETHRITIS AND AN IMPROVED METHOD OF APPLYING MEDICATION TO THE URETHRA.

BY

JAMES A. GARDNER, M. D., Buffalo.  
Visiting Surgeon Genitourinary Department, Emergency  
Hospital.

[The glass tubes] are of distinct value in treating [subacute and chronic] urethritis for the following reasons: They are easy of application and combine more valuable features than any other single remedy; [the mucous membrane is stretched to whatever extent is desirable] [the medication enters] into the recesses and follicles where the organisms are usually protected from treatment or the urinary stream.

In case [of] a stricture in the formative stages from a granular patch or from localized inflammation, this is the treatment for curing the discharge and removing the shreds as well as preventing by its prompt absorption the organization of the exudate and the formation of stricture. If a stricture has already formed, the dilation, with a local application to the mucous membrane to allay the inflammation and

brane to allay the inflammation and gentle massage at the point of constriction to increase the reaction, brings into action more factors toward its cure than any other single treatment.

7. Nodular masses and thickening of the mucous membrane are more promptly absorbed because the lymphatic and bloodvessels are toned up by the massage, cold, and medication.

8. [Whatever medicine the surgeon prefers] may be applied in this manner.

*Chronic [Gonorrhea] and Gleet.*—These terms have long ago been shown not to be synonymous, for a gleet may exist when persistent search fails to show gonococci, and on the other hand chronic gonorrhea need not cause a discharge. [*The varieties as given by Lydston are:*] 1. When [it] remains rather subacute, causing pain and discomfort on urinating and with frequent exacerbations, the prostate being often involved with a feeling of fulness in the perineum [and the other symptoms that accompany it.] 2. [When the discharge is very thin and watery or only evident in the morning—]

*The causes of chronic urethritis* in the large majority of patients are inefficient treatment and excesses during the acute attack or the convalescent period [of gonorrhea.] Very severe acute cases and especially reinfections may leave patches of submucous thickening which prolong the discharge and finally result in a stricture, which is one of the most frequent causes of a chronic discharge. Too early cessation of treatment is another important cause. The starting-point is usually in the mucous depressions where the inflammation persists and the organism is protected from the urinary stream as well as urethral irrigations or injections.

*Duration of the Contagion.*—"If we were asked to define the most characteristic trait of gonorrheal infection, we would be obliged to say its tendency to persist and recur," but upon this point there is great diversity of opinion. Finger requires the absence of gonococci, pus corpuscles, and periurethral complications before allowing patients to marry. Noeggerath takes a gloomy view of the subject and thinks that if a man has once had gonorrhea he never fully recovers. Keyes is more liberal and allows his patients to marry when there is a prolonged

gentle massage at the point of constriction to increase the reaction, brings into action more factors toward its cure than any other single treatment.

Nodular masses and thickening of the mucous membrane are more promptly absorbed because the lymphatics and bloodvessels are toned up by the massage, cold, and medication. [A great variety of medication] may be applied by this method.

*Chronic [Urethritis] and Gleet.*—These terms have long been shown not to be synonymous, for a gleet may exist where a persistent search fails to show gonococci, and, on the other hand, chronic gonorrhea may not cause a discharge. [Lydston divides these conditions into three varieties:] (1) When [the inflammation] remains subacute with occasional acute exacerbations accompanied by more or less pain and smarting on urination, the prostate often being involved with a feeling of fulness in the perineum, [together with frequent urination.] (2) [The discharge becomes thin and watery, being sometimes so scanty that nothing is visible, save a drop of mucopurulent fluid in the morning.]

*The causes of chronic urethritis* in a large majority of patients are inefficient treatment and excesses during the acute attack or the convalescent period; too early cessation of treatment, and the resumption of the ordinary modes of life, resulting in frequent relapses, each more stubborn than its predecessor; frequent repeated fresh infections, each attack being milder than the previous one but more prolonged. These conditions often leave submucous thickening and granular patches, and may lead to infiltration and subsequent sclerosis and contracture of the periurethral connective tissue—strictures. These are the most important factors in causing chronic discharge. The starting-point is usually in the mucous depressions, where the inflammation persists and the organism is protected from the urinary stream, as well as urethral irrigations and injections.

*Duration of Contagion.*—Johnson says, "If we were asked to define the most characteristic trait of gonorrheal infection, we would be obliged to say its tendency to persist and recur," but upon this point there is great diversity of opinion. Finger requires the absence of gonococci, pus corpuscles, and periurethral complications before allowing patients to marry. He believes that the newly formed epithelial cells growing from the deeper layers carry the germs to the surface, and in this way tend to throw them off unless there is an acute invasion again of the deeper

gleet of unknown origin, if no gonococci are present and he believes it has a beneficial effect upon the discharge. Finger believes the newly-formed epithelial cells growing from the deeper layers carry the germs to the surface, and in this way tend to throw them off unless there is an acute attack and invasion again of the deeper layers. White and Martin say it is safe to forbid coitus as long as gonococci can be demonstrated in the artificial acute cases from strong injections. The retention of a full-size

#### CONCLUSIONS.

1. The worst complication that is likely to follow a chronic urethritis is a stricture, consequently this should be borne in mind during the entire treatment.

2. The pathology is essentially a chronic inflammation of the subepithelial tissue (and especially around the follicles) which passes through two stages, that of infiltration and that of contraction.

3. All authorities agree that these soft, recent exudates may be absorbed before organization has set in. The most rational method of forestalling a stricture is by [the treatment of these conditions with the medicated sounds.]

4. [The ointment may be massaged into] the follicles and depressions where the germs are protected from irrigations and injections. The exudate thrown out around these follicles is frequently the starting-point of a stricture.

5. No other [single] treatment combines so many beneficial factors, *i. e.*, dilation, cold, massage, and medication uniformly applied to the entire membrane and depressions.

layers. Keyes is more liberal and allows his patients to marry when there is prolonged gleet of unknown origin, if no gonococci are present, and he believes it has a beneficial effect upon the discharge. White and Martin say it is safe to forbid coitus as long as gonococci can be demonstrated in the artificial acute cases from strong injections. The retention

*Conclusions.*—(1) The worst complication that is likely to follow a chronic urethritis is a stricture, consequently this should be borne in mind during the entire treatment.

(2) The pathology is essentially a chronic inflammation of the subepithelial tissue (and especially around the follicles), which passes through two stages, that of infiltration and that of contraction.

(3) All authorities agree that these soft recent exudates may be absorbed before organization has set in. The most rational method of forestalling a stricture is by [packing the urethra.]

(4) [The medication is in close contact for hours with] the follicles and depressions, where germs are protected from irrigations and injections. The exudate thrown out around these follicles is frequently the starting-point of stricture.

(5) No other treatment combines so many beneficial factors, *i. e.*, dilation, massage, medication uniformly applied to the entire membrane and depressions [and for a considerable length of time.]

From the foregoing it would seem that Dr. Gardner has appropriated rather more of my paper, in advancing his idea of packing the urethra with gauze, than is customary in literary work. To summarize: The titles of the articles are the same, about 2,300 words have been copied verbatim from the body of my paper, and the conclusions are nearly the same. The some 1,500 words which constitute the remaining portions of Dr. Gardner's article are, so far as I know, original with himself since a search of the literature has, thus far, failed to reveal any other authorship.

The sole credit given to the author of the article so freely used is in the bare mention of my name in the bibliography. The only quotation marks in the publication in the *Record* are those which were transferred from my article.

#### HYPOTHESIS CONCERNING SOUL SUBSTANCE.

BY

AUGUSTUS P. CLARKE, M.D.,  
of Cambridge, Mass.

*To the Editor of American Medicine:*—In regard to Dr. Macdougall's conclusion in his paper entitled "Hypothesis Concerning Soul

Substance, together with Experimental Evidence of the Existence of such Substance," published in *American Medicine*, April, 1907, I think that it is regrettable that the author did not give in detail the record of temperature (both internal and external) as it occurred in the last hours of the several persons dying from the effects of the various diseases in which

there had been at the time of death an apparent lessening of the weight of the body. It has long been held in nearly all cases of death that there is more or less elevation of temperature at or soon after death due to the arrest of the circulation and to the failure of the blood to be cooled in its passage through the respiratory tracts. Such fact I have many times been able to verify. On July 25, 1906, I was called to a patient, a young man, aged 18, who had suffered greatly since July 26, 1904, from the effects of pericarditis and to a considerable extent from endocarditis. The patient died that evening while I was present at his home. He had been failing very fast that day. At first when I was called at 8 p.m., the temperature by the mouth was  $106.2^{\circ}$  and that at the axilla was nearly the same; the pulse was very rapid and the dyspnea very urgent. Thirty-two minutes after that record the temperature by the mouth (internal) had mounted to  $108^{\circ}$ , but was less by half a degree as taken in the left axilla (external). Twenty-one minutes later the temperature by the mouth was  $110^{\circ}$  but was considerably less at the axilla ( $2.5^{\circ}$  less); the patient had then ceased to breathe and the blood was, of course, no longer receiving the cooling effects of the air through the respiratory passages. The patient was not weighed but the sudden mount from  $108^{\circ}$  to  $110^{\circ}$  and over, by the failure of the blood to receive the cooling influences of the air, would have been deemed quite sufficient to account for the rapid loss of three-fourths of an ounce in weight in an inappreciable lapse of time by insensible transudation of fluid, as must have taken place without doubt in one of the cases reported by the author of the paper referred to above. Such a condition would seem to be quite sufficient to account for the sudden loss of weight without having to resort to the necessity of supposing that a distinct entity of a ponderable soul substance had escaped to regions of unknown space. April 2, 1906, I was called to a patient, a lady, aged 24, married, who had been suffering some two years with tuberculosis. She was then in a dying condition. It was surprising to note how within a space of less than one hour, her temperature by the mouth (internal temperature) rose from  $103.8^{\circ}$  to  $107.2^{\circ}$  as the patient rapidly was ceasing to breathe. The temperature taken in the axilla (external) was fully a degree lower almost immediately than was that taken by the mouth as inspiration ceased altogether. Though the internal organs of the body are poor conductors of heat, yet the tissues near

the general surface of the body are prone to radiation of heat and to the diffusion of moisture, particularly immediately after respiration ceases. I will only mention another case, which was of strychnin poisoning in an elderly gentleman. The drug was administered by mistake of his wife as she thought the substance was morphin instead of strychnin that that had been procured by him for rat poisoning. Two other physicians were also called at the same time. The stomach pump was freely used but as considerable time had elapsed before we were summoned the patient succumbed in spite of our efforts to save him. There had been no febrile reaction before the fatal dose was taken. The patient had, however, been accustomed to take occasionally a small amount of morphin for rest and its soothing influences. The muscular contractions in this instance were excessive. The rapid development of opisthotonus was frightful in the extreme. As the respirations became shallow the temperature by the mouth rose and as the last sigh was taken and the respirations had ceased, one of the best English thermometers marked the degrees of temperature  $109.4$ . The surface of the body then seemed relaxed and dry through the internal influences of the great degree of heat within and the absence of the cooling agency on the blood of the air that could no longer enter the respiratory passages.

I will make no further reference to my records in regard to elevation of temperature that may happen at death but merely say that if there is a sudden loss of appreciable weight of body at the time of that event, it is my conviction that it would undoubtedly be due essentially to the agency of the factors as above indicated. As to the proof of the immortality of the soul or of a life beyond it must be confessed that science has not as yet offered any help favorable to the conception of that idea. The reality of such an existence, if I may so use the term, can only be indulged in through hope or rather through faith, as St. Paul so graphically urged the doctrine on his followers.

**Medicine in the Duma.**—The medical profession is more largely represented in the new Duma than in the last. So far as is at present known there are 25 medical members of the Russian Parliament; the majority belong to the Cadet party and to the Extreme Left.

**Compulsory Thrift.**—The Hungarian Chamber of Deputies has passed a bill providing that insurance against sickness and accidents shall be compulsory.

## ORIGINAL ARTICLES.

### ON THE PATHOLOGY AND THERAPY OF ANGINA PECTORIS.<sup>1</sup>

BY

PROFESSOR THEODOR SCHOTT, M.D.,  
of Nauheim, Germany.

Among chronic diseases of the heart angina pectoris has in our century kept alive our medical interest in a most remarkable manner. Judging by the first excellent description by Heberden, more than a hundred years ago, the opinions regarding the nature and the causes of the stenocardiac attacks were in sharp opposition. This may be explained in a great part by the fact that, as Latham justly remarks, angina pectoris must be regarded, not as a disease *sui generis*, but as a series of symptoms. But even in regard to angina pectoris vera—which is exclusively to form the object of this discussion—opinions are still much at variance.

The hypothesis of Heberden and Latham that the anginal spasm is to be regarded as a real tetanic contraction of the cardiac muscle, has found at different times a varying number of adherents. A tetanic cramp of the whole cardiac wall would, if it prevailed but a short time, certainly destroy human life, but a partial tetanic contraction of a part of the heart might take place without deadly result as was demonstrated latterly by the experiments of Basch and Grossmann.

In direct opposition, however, is Parry's theory which has been efficaciously supported by the celebrated Stokes. According to this opinion, the angina pectoris must be attributed not to an increase but to a further reduction of the muscular strength of a heart already enfeebled.

According to Parry the stenocardia is a sort of syncope preceded by a strong and painful oppression in or near the heart, the consequence of an organic lesion which becomes apparent by a decrease of the energy of the heart. Thus Parry opines that the symptoms are caused by an accumulation of blood in the cardiac cavities. The explanation found powerful support in

<sup>1</sup> Read before the Medico-Chirurgical College in Philadelphia, Pa., etc.

Germany from the celebrated Professor Traube, who was considered a first class authority in the domain of heart diseases. Traube, too, supposes a weakening of the heart's muscle. But he thinks that the symptoms result from a rapidly increasing tension of the walls of the ventricles under the influence of an accelerated overfilling of the cardiac cavities, in consequence of which, the motor as well as the sensory nerves of the heart undergo a pressure arising from a tension or contusion that sufficiently accounts for the sudden pain. Samuelson, whose experiments are founded upon an artificial constriction of the coronary vessels, differs from Traube only in that he supposes the overfilling of the heart to take place not in the left ventricle but in the left auricle.

We have, beside, to state the opinions of French medical men represented chiefly by Potain, Germain-Sée, etc., who attribute the attack to an ischemic state of the cardiac muscle. The pains are to be explained in the same manner as those we observe when there is a blocking of the arteries or in cases of endarteritis obliterans. But the ischemic state of the cardiac muscle causes also a weakness of the organ, so that this theory, with some modifications, agrees in the main with that of Parry-Stokes. Though the latter view numbers a majority of adherents, as appears, for instance, from the meetings of the London Medical Society, there has arisen a new opposition, among other places in the Congress of Internal Medicine at Wiesbaden, 1891, where Vierordt, one of the medical men who opened the discussion, revived the old doubt as to whether the stenocardiac attack really depends upon debility of the heart. The principal arguments are that the pulse need not change, that the volume of the pulse need not be decreased, and that in some cases the pulse even becomes stronger. Another argument is that evident signs of weakness of the heart are not sure to appear.

Before we enter into these theories let us consider which processes lead to angina pectoris vera. They are, in the first place, sclerosis of the coronary vessels, alterations of the aortic valves and aortitis, especially that form which

causes an ectasia of the ascending part. In a case of angina pectoris combined with insufficiency of the mitral valve which has been under my treatment for several years, I recently observed the development of an aortic stenosis, so that also in this case, though there were no other signs of rigidity of the vessels, the sclerotic process in the heart cannot any longer be doubted. I have recently seen a large number of similar cases. We know that the sclerotic alteration of this precise part of the aorta exercises an influence on the place where the coronary vessels take their origin and we often observe at necropsy that, though the other parts of the coronary arteries still showed a sufficient volume, at the spot mentioned it was narrowed to such a degree that scarcely a bristle could be introduced. The first consequence of this arterial alteration is that, through the decreased circulation, the muscles of the heart are no longer as sufficiently nourished as before, which is equivalent to a weakening of the heart, and thus the energy of the muscle is sure to be reduced. The same occurs in the stenocardiac attacks of the angina pectoris vasomotorica (pseudoangina the consequence of so many different causes may be left aside). The heart has to exert itself against a contracted arterial system, so that also in such cases there is reason enough for weakness of the heart, and this opinion of mine has found support from several medical men in recent years. A weakening of the heart being made apparent, it may be easily understood that in such a heart every increase of action is likely to be followed by a more intense as well as sudden debility. The suddenness of the paroxysm may also be explained directly by the sluggishness of the circulation within the coronary vessels. A moderate distention of the cardiac muscle may, in the narrowed lumen of one or several coronary vessels, easily lead to a temporary total blocking. In other cases a thrombus or an embolus is the cause of the total closing, and we know that such arterial process is the cause of violent as well as sudden pain in other parts of the muscular system. The experiments of Samuelson, Cohnheim, Schulthess and many others

have furnished us with sufficient proofs of this.

Let us see whether the observations in practice confirm what we have before stated. I confine myself to referring to my own experience and lay stress upon the fact that I never could perceive an absolute invariability of the circulatory system before, during, and after the attacks. Let us first look at the state of the pulse. For that purpose we must not depend entirely upon our examining the pulse with the finger; we must have recourse to the sphygmograph and the sphygmomanometer or tonometer. How often do we recognize by means of these instruments that, for example, a bradycardia, which we observe from time to time, is in a number of cases only an apparent one, that through the sphygmograph we become aware of a number of pulsations which were not observable by feeling with the fingers, so that the bradycardia may be in reality a tachycardia. In other instances we have to deal with a real tachycardia or we have to state an intermittent or arrhythmic pulse; and that the volume of the pulse often appears reduced is a well known fact. With a large number of patients I discovered a reduction of the pressure of the pulse during the attacks, a circumstance which applies especially to the form of the pulsus celer the tension of which is frequently apt to lead to mistakes.

Now let us proceed to the examination of the heart itself. In the very beginning of this cardiac condition it is frequently very difficult to note distinctly a difference in the strength and character of the heart-sounds between the time of the attacks and that of an undisturbed state. There are other cases in which a great difference becomes rapidly apparent. But it will not escape the attention of a practitioner who has had occasion to watch such patients for a longer period, that the heart sounds become more feeble during the attack; in other cases the sounds become dull and impure; distinct murmurs are observable and not very rarely. I have convinced myself that the arrhythmic state takes the character of a rhythm, of a gallop. The beatings of the heart very seldom become similar to fetal nature, or we remark a fluttering heart.

More evident proofs result from percussion. If we trace exactly the limits of the heart with the help of a solution of silver nitrate—I avail myself of the method of my late brother, August Schott, that is, a percussion with lateral limitation by which we are enabled to percuss the anatomic limits of the heart, which fact I have often demonstrated among others in presence of several medical men of the Maison de Santé at Berlin—we observe the following conditions according to the more or less advanced progress of the disease. There is, in the beginning, a moderate dilation, which especially affects the left side of the heart; for a certain time the left auricle may be more extended than the left ventricle. If the illness increases, the heart gets more and more extended; the right side of the heart also becomes affected, but the left ventricle remains dilated for a longer time until finally the entire heart remains enlarged. In such cases, in which the limits of the heart do not recede to a normal state, we behold the stenocardiac and other symptoms of a cardiac dilation, that is of lack of compensation, such as breathlessness, palpitations, etc. Debility of the left heart is the characteristic confirmed by percussion at the beginning of the complaint.

I was gratified by succeeding in demonstrating and confirming these results of percussion by means of the röntgen rays, the latter being likewise an important adjunct for our physical examination.

I had occasion some years ago, when making a number of experiments with röntgen rays in cases of cardiac muscular diseases, to take a radiogram of a man, aged 40, at the very moment in which he was taken with an anginal attack. (Of course I made also an examination with the fluorescent screen.) This patient had consumed, in former years, large quantities of beer and wine with a good deal of effervescent waters. Seven years ago he suffered the first attack of gout. Since that time he has had frequent attacks of podagra and gonagra; the last one took place a fortnight before this examination. (At the left elbow some weeks ago a tophus appeared.) The first attacks of oppression were felt when he was bicycling; later palpitation

and breathlessness resulted from any overexertion. In the last months the oppression in the chest increased, accompanied by radiating pains in the left arm and fingers. The stenocardiac attacks were mostly observed in cold weather, especially in cold winds and fogs so that he had to stop his walks in the streets. In the later periods his medical adviser was enabled to discover a distinct cardiac dilation. The urine had a specific weight of 1015 and showed a trace of albumin but no casts.

In a former treatise I drew attention to the fact that, with the help of leaden discs fixed on both nipples, we have the means of ascertaining whether the patient had in each examination kept the same distance from the photographic plate (respectively from the fluorescent screen) to the röntgen tube. One of these shows distinctly the size of the heart during the spasm.

With the view to stop the anginal attack I ordered at once exercises with resistance and a reduction followed immediately after those exercises. The limits of the heart were reproduced by means of the fluorescent screen, the drawn lines being taken during the attack, the dotted lines after the exercises. The drawing of the fluorescent screen as well as the radiogram showed the dilation of the left ventricle and chiefly of the left auricle during the attack and it need only be added that the pulse, which showed a frequency of 90 per minute with a small volume, went down as low as 74 with a good condition.

It must be stated especially, that the anginal attacks are readily produced by bodily movements and mental excitement. A somewhat accelerated pace, a little mounting, even a turning round in bed, or breathing in cold wind or fog often suffices to cause a stenocardiac spasm which, however insignificant, may cause a certain increase of work in the heart. Under favorable conditions and especially in a state of absolute rest those attacks generally soon disappear.

The wellknown etiology needs no special description, but I must not fail to mention that heredity plays a prominent part in this disease, and I have witnessed a good number of cases

where in one and the same family quite a number of individuals suffered from angina pectoris.

We have now to discuss the therapy of this disease, which affords us further proof of the correctness of the Parry-Stokes theory. Setting aside the prophylaxis, the medical treatment is divided into (a) the therapy of the anginal attack itself; and (b) the treatment of the heart in the pauses between the attacks.

The attacks are most efficaciously opposed by the use of nitrites and, in this respect; the publications of William Broadbent, Lauder Brunton, etc., are so well known that I scarcely need enter into further details. Nitroglycerin is, in most cases, superior to amyl nitrite as its effect is generally prompter and more intense. I decidedly prefer the liquid form to the tabloids on account of its quicker effect and the more minute regulations of the dose. But we know that the inhalation of amyl nitrite proves successful in some cases in which nitroglycerin fails to relieve. In some cases I have seen good results from the use of erythrol tetranitrite but my experience is not yet extensive enough to justify a decided opinion about it. Nitroglycerin used in proper cases has frequently quite a striking effect, but its application certainly requires much caution, experience, and constant medical supervision as, in default of these precautionary measures, accidents are but too likely to occur. Antipyrin, formerly recommended by the French and especially by Germain-Sée, has lost ground more and more because its effect proved not only more or less questionable but it is liable to endanger the patient's life. The paroxysm of pain may also be overcome by the application of external remedies, such as friction with alcohol or preferably hot alcohol with an addition of salt, mustard spirits or mustard leaves, etc. I have derived the best results, however, from the application of heat. For that purpose I have ordered a special India rubber bag to be made and provided with a thermometer which always remains in the hot water in such a manner as to allow the temperature of the water to be regulated at any moment. Such a bag containing water of 140°-160° F. being shifted gradually

over the entire region of the heart and chest brings relief in a large number of cases, or produces the absolute cessation of the pains.

In a number of cases, however, we must expect to be disappointed by the effect of all the aforementioned pharmacologic remedies because pains become so intense that we are forced to have recourse to narcotics. First among these stands morphin. When it cannot be dispensed with it is advisable not to use it for too long a time. Single larger doses should be given in preference and, if necessary, subcutaneously. The injurious effect on the heart of a longer use of morphin may be considered generally admitted. Iodin is a medicament to be used during the attacks as during their intervals. All salts of potassium being more or less detrimental to the heart and, as in cases of angina pectoris vera, sometimes producing collapse, I always prescribe sodium iodid as least injurious. Considering their irritating effect on the mucous membranes and hence on the digestive organs, sodium iodid, like all salts of iodine, is best administered in milk. Sodium iodid has proved very useful in a series of cases even when there had been no syphilitic disease before; in other cases, however, it fell short of expectation. Nor should this medicament be given for a long time or in a larger dose and care must be taken to control the weight of the body for the reason that all the salts of iodine are apt to destroy the molecules of albumin and thereby often cause more injury than benefit.

In the intervals of the attacks, and when necessary during them, we have to exert ourselves to stimulate and to strengthen the heart.

As stimulants we recommend chiefly either camphor or salts of caffeine. I have to warn the practitioner, nevertheless, against the use of caffeine sodosalicylate because I have noticed strong relapses after the administration of it, though never after that of caffeine sodobenzoate or caffeine citrate.

It is a wellknown fact that digitalis fails much more frequently in cases of angina pectoris vera than in many other diseases of the heart; this applies to the uncomplicated forms caused by sclerosis of the coronary vessels as

well as to those which are combined with aortic valvular lesions or aortitis. We must not, however, undervalue the usefulness to such an extent as has been done latterly in different quarters, for, though the pains are little or not at all influenced by its use, we often succeed in obtaining a beneficial effect from this important medicament in cases of heart disease. Little reliance is to be placed in strophanthus, which too often proves useless, while it need scarcely be mentioned that still less trust is due to convallaria, adonis, etc.

Physical therapy shows its value in a most satisfactory way in exactly these cases and the tonic effect of balneologic and gymnastic treatment, as described by my late brother and myself, here becomes quite evident. I abstain from describing the details of our system and only lay stress upon the importance of much caution in the application of the baths as well as the therapeutic exercises. I warn in a special manner against an early use of strong effervescent baths and especially of the strongest form of the effervescent flowing baths. Moreover, more injury than benefit can be derived from either too cool or too warm baths. We are rarely allowed to go below 85° or above 93° F.; and even from a temperature of 95° F. I have now and then observed unfavorable effects. A long stay in the bath is not desirable; my usual limit is 15 minutes and I seldom go as far as 20 minutes.

Similar precautions are to be adopted as regards the exercises. The resistance must not be very strong; the pauses between the exercises are not to be too short and the patient must never be suffered to work till fatigue comes on. Sufficient rest after the exercises is important under all circumstances.

I demonstrated years ago, in a series of articles, the results of the balneologic and gymnastic treatment, especially in cases in which rest as well as pharmacologic remedies proved useless. In the last 20 years good results have been confirmed by many medical authorities like Bezly Thorne, Lauder Brunton, Broadbent, Saunby, Osler, Babcock, Tyson, Anders, Solis Cohen, Kinnicutt, etc. I have to state, moreover,

in reply to many inquiries recently addressed to me on this subject, that our method has proved most successful even in cases in which the nitrites and chiefly nitroglycerin have often failed. I refer especially to a treatise of Rives published in the *New York Medical Journal*, April 11, 1896. He had occasion to observe a patient who was under my treatment and who had been sent to me by Lauder Brunton.

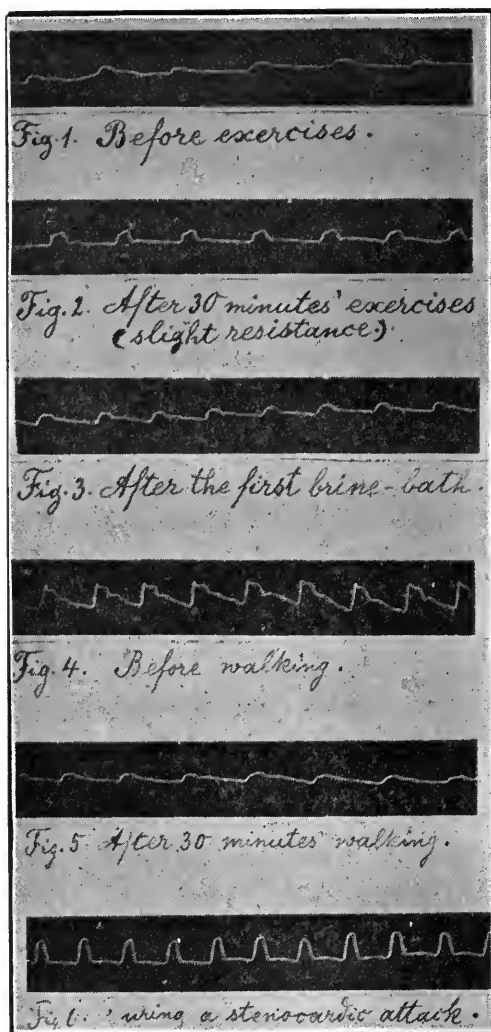
A gentleman, C., from Kurachi (India), aged 53, was subject to so many stenocardiac attacks that, in the first few days of his stay at Nauheim, he was obliged to have recourse to as many as 20 tabloids of nitroglycerin a day. A treatment of 13 weeks not only caused all symptoms to disappear but produced a general state of euphoria. It is worthy of attention that this patient enjoyed good health until great mental excitement, resulting from the ravages of the plague in his town, subjected him again to light attacks. A renewed treatment in Nauheim of seven weeks in the spring and five weeks in the autumn had again the effect of removing his complaints so that Lauder Brunton, on the patient's return, found everything satisfactory and stated a perfectly normal condition of the heart.

I have enjoyed opportunities of seeing this patient several times during the past ten years. The continual excitement brought on by repeated returns of the plague at Kurachi produced palpitation accompanied by cardiac debility with anginal attacks. We succeeded, however, in maintaining the strength of his heart. Since his return to his native country, England, four years ago, he is feeling quite well and performs his duties without molestation.

I must not omit to mention that the same precautionary measures as regards diet, exercise in the fresh air, dress, etc., have to be observed with such patients as with those subject to heart diseases, viz., lack of compensation with valvular lesions, myocarditis, etc.

It is, however, understood that not all cases are suitable for a balneologic or gymnastic treatment. When the arteriosclerosis has made so much progress that there is danger of embolism or apoplexy threatens, or when we observe or have reason to think that there exists even a small aneurysm of the wall of the heart or aorta—such a one cannot always be discovered by röntgen rays—which might lead to a rupture, every increase of blood-pressure, which is gen-

erally a natural consequence of the above treatments, might lead to fatal consequences. Rigidity of the vessels or the beginning of the arteriosclerosis is to be treated by our system and usually yields satisfactory results, but I must lay stress again upon the fact that very advanced sclerosis is an absolute contraindication to this



treatment. I warned against this latter state years ago and my later experience has only strengthened my view on this point. In such cases absolute rest is certainly preferable.

In conclusion, looking once more to the actual state of our therapy, we ascertain that the results obtained from the application of the leading

among the above mentioned medicaments are explained by the lowering of the blood pressure and the moderation of the heart's action consequent upon it. The results obtained by the balneologic and gymnastic treatment may be explained by their tonic action. The distressing symptoms of angina pectoris are either removed or reduced by strengthening the heart's muscle as well as by acting on the cardiac nerves, in other words also *ex juvantibus* we behold the good foundation of the theory of Parry-Stokes.

I will fully describe one case, to show the exact mode of procedure of the treatment.

H., merchant, aged 40, came to me July 21, 1886, his history being as follows: His occupation necessitates the lifting and carrying of heavy weights such as boxes of stuffs on and off shelves, and he was accustomed to drink large quantities of alcohol daily, chiefly beer. In December, 1885, he underwent severe mental excitement and worry. A few days later began severe attacks of pain in the region of the heart; the attacks increased in frequency and severity with palpitation and dyspnea. From April 10, to 18. 1886, these attacks became so frequent that he had to remain in bed. Since that time not one week had elapsed without these attacks occurring both during the day and the night.

Status on July 28, 1886: Patient—whom I had the opportunity to examine first during the course of an attack—appeared very pale; feared to move or to breathe because of the severe pain and hence respiration was irregular and superficial. His chief complaint was of pain in the region of the heart, especially in the upper third of the sternum and the left second intercostal space radiating to the left arm and the back. The pulse was scarcely perceptible, easily compressible, irregular and about 50 per minute in frequency. Pressure of the pulse (measured by Basch's sphygmomanometer) 80 mm. Hg. There was slight rigidity but no real hardening of the radial artery nor any signs of advanced arteriosclerosis.

Therapy: With the weakest possible resistance I made him execute some of the exercises proceeding with such caution as to divide every single movement into periods of rest; between each exercise was a longer period of absolute rest. He was carefully watched to insure that during the exercises the respirations were long and not superficial. Already after 10 minutes of these exercises the patient felt relieved and after 13 minutes almost free from his complaints.

Previous to this, as the patient told me, the attacks had lasted from at least half an hour to two hours and longer. The pulse was now 72, of fuller volume and regular. Figs. 1 and 2 show very distinctly the difference before and after the exercises, pulse pressure varying between 85 to 90 mm. Hg. The patient complained of feeling tired and languid. The following night his sleep was interrupted and he felt restless.

The succeeding day (July 29) he had his first bath, containing 1 percent of brine (without  $\text{CO}_2$ )  $91.5^\circ \text{F.}$ , 5-6 minutes' duration. After that he felt stronger and more comfortable. Respiration regular, pulse rhythmic, but still of small volume, bloodpressure 90 mm. Hg. (Fig. 3.)

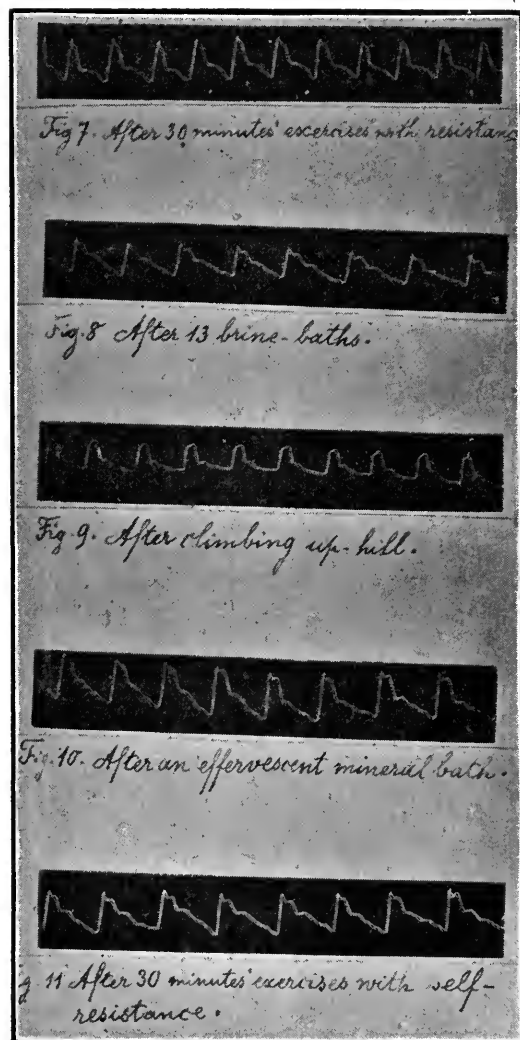
The following days the patient felt stronger; the duration of the baths was increased to 8-10 minutes, omitting every second day. In the evening of August 2, disregarding his orders, he drank beer and that caused, during the night, a renewal of anginal pains and oppression, with insomnia. On the following morning the pulse was irregular and scarcely perceptible. August 3 and 4, he felt better; August 5, he took a walk of half an hour which was followed by a sensation of oppression in the cardiac region but there came no anginal attack. The pulse before the walk was regular and of full volume while after the walk it was arrhythmic, and of a small volume. (Figs. 4 and 5.) Against my advise H. failed to keep moderately quiet during the next few days and in the night of August 8, and the forenoon of August 10, he suffered from slight stenocardiac spasms. These last attacks I observed myself and could state the good effect upon him of one-half hour exercises with slight resistance. The size of the dilated heart was reduced and the quality of the pulse improved, as Figs. 6 and 7 show without further explanation, and the anginal attack during the exercises passed off.

In the next days, the concentration of the brine was increased to 2 percent; the duration lengthened to 15 minutes, the temperature decreased to  $90.5^\circ \text{F.}$  The patient felt comfortable during the next week.

Pulse pressure rose to over 100 mm. Hg. Frequency of the pulse varied between 72 and 80, with full volume, as Fig. 8 demonstrates. At this time the patient was able to walk every day about one-half hour on a level without feeling any discomfort, so that he independently undertook to climb uphill. During the exertion he experienced palpitations and dyspnea and after his return he had strong oppression in the cardiac region. I found his heart a little dilated

and the pulse, as seen in Fig. 9, again of a smaller volume. All these symptoms disappeared under intermittent application of heat over the heart (as I have described it in several of my papers) and by very carefully guarded exercises with resistance; a real anginal attack did not appear. The pulse as well as the limits of the heart became normal.

The baths during this time were more and



more concentrated, the addition of motherlye (up to 6 liters per bath) made chiefly the amount of chlorid of lime considerably increased; the temperature was lowered to  $88^\circ \text{F.}$  and the duration of the bath lengthened to 20 minutes.

The patient, who lived now exactly according to the medical prescriptions, drank daily several

cups of milk and cocoa and only a small quantity of an old light wine, taking every three hours a small quantity of easily digested nourishment. He could walk now for two hours on a level without discomfort.

On August 28 he took his first effervescent (sprudel) bath of 10 minutes' duration and felt very comfortable after it so that we continued with these baths. A pulse tracing (Fig. 10) after the fifth effervescent bath on September 2, shows distinctly the good effect. The blood-pressure went up to 120 mm. Hg. And now the patient learned the exercises with self-resistance which he made use of for one-half hour 2-3 times daily. This effect is demonstrated by the pulse tracing as shown in Fig. 11. The pulse pressure rose to 135 mm. Hg.

After eight weeks' treatment the patient left Nauheim, having taken 12 simple brine baths, 13 thermal baths with a small amount of CO<sub>2</sub>, and 13 strong effervescent baths. Objectively nothing abnormal was to be found either in the heart or in the whole circulatory apparatus and also subjectively the patient remained in good health.

In the following winter H. was able to make long business journeys and had only twice slight anginal attacks. He kept up continually the self-resistance exercises. In July of the next year he returned to Nauheim for a second course of treatment. His appearance was most healthful and he complained only of having from time to time interrupted sleep and loss of appetite. Occasionally following hiccoughs, there was a disturbance of the heart action or even palpitation. Objectively nothing wrong could be detected in the heart. He stayed six weeks in Nauheim and at the end of this time could walk long distances and even climb easily moderate slopes, but upon steep paths he suffered immediately from palpitation.

After having taken 32 baths (of which 15 were sprudel) he felt well in every respect.

I have had the opportunity of examining this patient several times in the following years and could no longer detect any abnormality and he has experienced no discomfort whatever in fulfilling the duties of an active life.

**Mortality from Overlying.**—In the week ending April 9, 14 infants were reported in the cities of England as having been suffocated in bed.

A school of malingering has been discovered in Rome in the course of inquiries made by insurance offices in regard to claims for injuries said to be the result of accident.

## PREVENTION OF ADHESIONS AFTER ABDOMINAL OPERATIONS.

BY

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No specific for the prevention of adhesions in the peritoneal cavity has thus far been discovered. The specially prepared ox peritoneum suggested by Dr. Charles Cargile, of Arkansas, and introduced into somewhat general use through Dr. Robert T. Morris, has been shown by the thorough experimental work of Drs. Albert B. Craig and Aller G. Ellis to promote rather than prevent adhesions. Floating the intestines away from raw surfaces by introducing quantities of saline solution into the abdomen has also failed; the dusting of raw surfaces with aristol has not met general approval; and so with all specifics. On the whole adhesions tend to save life: "We cannot expect nature to differentiate; it is left to the devices of the surgeon to prevent, if he can, adhesions when they would be harmful." Intestinal obstruction as the immediate or remote result of adhesions is fortunately a rare after-complication, but probably every surgeon occasionally sees such obstruction, and the condition is serious enough to make anyone take thought for measures of prevention. But for every case of obstruction there are no doubt hundreds of less serious but still distressing results of adhesions.

Observation of the conditions inside the abdomen, when a second operation has been necessary, has convinced me that a large proportion of the cases of chronic constipation and flatulence in patients who have undergone abdominal operations, is due to adhesions and not to intestinal paresis, the condition usually assigned as the cause in these cases. Beside the ill-health which results from chronic constipation and numerous cases of indigestion, many patients suffer more or less severe and constant pain, and probably every surgeon has opened the abdomen occasionally for nothing more than the relief of such pain resulting from post-operative adhesions. The purpose of this paper

is not to advocate a new specific but to emphasize the importance of a number of details, part of them somewhat generally observed, others not previously mentioned so far as I know, which followed, make for the highest success in abdominal surgery; for I believe that this is one of the complications, like postoperative ventral hernia which can be prevented in the vast majority of cases.

Measures designed to prevent troublesome adhesions naturally fall into two classes: Those concerning operative technic, and those concerning the preparation and after-care of the patient. Pilcher<sup>1</sup> has recently discussed the question most satisfactorily so far as operative methods are concerned, but repetition can do no harm and may serve to emphasize the importance of careful work, and a few additional points deserve mention.

During the operation unnecessary exposure to the air and drying should be avoided, for even this has been shown to damage the sensitive serosa. Only in case of urgent necessity, as for instance in searching for the cause of intestinal obstruction, is extensive handling and exposure permissible. Any considerable evisceration almost always involves rough handling to return the bowel to the abdomen, and extensive handling is a fruitful cause of adhesions. If exposure of the serosa is necessary, partial protection with compresses moistened in normal saline solution is often possible.

The use of antiseptic solutions within the abdomen is condemned by most American surgeons I believe, yet I have before me a recent textbook on surgery, which is quite widely used in this country, in which antiseptic irrigations of the peritoneal cavity are mentioned as suitable for certain cases. Such teaching if followed will certainly lead to trouble, for abundant observations have proved the destructive effect of such strong irritants on the delicate serous surfaces.

Perfect arrest of hemorrhage and removal of all clots removes another source of adhesions, but probably in no part of the body are methods

in common use for hemostasis which may be seen every day in abdominal surgery: I refer to the clamping and tying of large masses of tissue. Not only are very large and powerful hemostatic forceps used but many are now advocating the routine use of the angiotribe and the electrothermal angiotribe. Crushing and devitalizing large masses of tissue in this way would not be considered permissible in many parts of the body and though success with such methods is possible in the abdomen because of the great resisting power of the peritoneum, it seems by no means the ideal surgery. As Pilcher very forcefully puts it: "In the effort to get rid of the ligatures have been devised the various models of crushing clamps, or angiotribes, so called, used alone or associated with a cautery to the stump, engines for the wholesale hemostasis of masses of tissue, leaving behind a long line of crushed and devitalized tissue to invite adhesions and infection. Their use smacks of a mechanical surgery in which anatomic knowledge and the definite application of a certain and delicate surgical technic is disregarded. In intraperitoneal work, just as in all other portions of the body, in the great majority of instances bleeding may be controlled by the judicious application of ligatures to certain readily identified vessels of supply." To do hysterectomy by such methods seems a step backward from the systematic and accurate control of blood supply by ligation of the main arteries, the ovarian and uterine, as advocated by Stimson<sup>2</sup> over 17 years ago.

Gauze drainage and packing is another common source of adhesions. Of late I use drainage much less frequently than formerly and I believe this is true of the practise of many others. The gauze is usually covered by a split rubber tube or gutta percha protective, and is removed early and frequently not replaced.

Most abdominal surgeons are careful in their closure of abdominal incisions in these days but some are not, and one often sees the abdomen closed rapidly and carelessly without very much attention to probable results. It seems

<sup>1</sup>Long Island Medical Journal, January, 1907.

<sup>2</sup>New York Medical Journal, March 9, 1889.

almost unnecessary to mention the importance of closing the peritoneum separately if we would prevent adhesions. This is best accomplished by seizing the edges of the peritoneum on either side with forceps and drawing it up so that the serous surfaces are approximated, while the raw edge is rapidly whipped over with a continuous fine suture. In this way little, if any, of the suture appears within the peritoneal cavity to act as an irritant and invite adhesion of intestines or omentum. All surgeons know how rapidly serous surfaces heal when approximated by the Lembert intestinal stitch, but many fail to take advantage of this rapid healing by closing the peritoneum with slightly everted edges and the serous surfaces in contact, as above mentioned, instead of edge to edge. A continuous stitch is preferable to interrupted stitches for the reason that between each interrupted stitch is left a small gap, when the peritoneum is put on the stretch. Personally I prefer to use a double thread of very fine plain catgut. Doubling the thread gives sufficient strength with a very fine suture, which is rapidly absorbed. A suture that will last for 72 hours is quite large and strong enough, as firm adhesion of the peritoneum will have occurred in a shorter time than this. Heavier and slowly absorbable sutures are no doubt desirable for muscles and specially for the aponeurosis but are entirely unnecessary for the peritoneum. The careful covering of all raw surfaces within the abdomen has long been practised by most successful surgeons, but in their haste to do a speedy operation, I believe that there are still a considerable number of men who neglect to accomplish this as thoroughly as is possible. With a little thought and care it is often possible to dissect off a flap of peritoneum from the surface of a tumor or to save a good part of the broad ligament to cover a surface which would otherwise be left raw and certain to give rise to firm adhesions. Such intraperitoneal plastic work is also best accomplished with a very fine absorbable suture and the time consumed is usually not great. This is perhaps the most important of all means for avoiding extensive postoperative adhesions.

The importance of preparatory and post-operative treatment is more or less generally appreciated, but its bearing on the prevention of adhesions is frequently overlooked. The intestines should be thoroughly emptied before operation so as to occupy the least possible space. Adhesions no doubt occasionally form, even though serous surfaces be not actually denuded, for if the intestine be distended by feces and intestinal gases, the intraabdominal pressure is sometimes tremendous, as every surgeon knows who has endeavored to return much distended coils of intestine to the abdomen during operation. In order to empty the intestine thoroughly it is desirable to begin not later than the second day before the operation, and in the case of some patients, who are chronically constipated, it may be necessary to begin a week before the operation. What cathartic is used is perhaps a matter of less importance than that good sized repeated doses be given, until thorough purgation has occurred. My own preference is to give divided doses of calomel, on the evening of the second day before operation, followed in 12 hours by a moderately large dose of castor oil, which should be repeated if the bowels do not move very freely. Calomel acts so slowly that the patient's rest is seldom disturbed if it is given in the evening and the castor oil or other purgative given in the morning is through acting by bed time. On the morning of the operation, enemas until the water comes away clear complete the emptying of the bowel. The dose of cathartic can usually be regulated to avoid purgation to the point of weakening the patient. When well emptied the intestines fall away from the abdominal wall on incision and occupy little more than half the abdominal cavity. They are much less likely to crowd into the region of the field of operation after the abdomen is closed. They certainly always gravitate away from the abdominal wall when the patient is lying on the back. They contain nothing to ferment and form gases to distend them.

The influence of gravity may be used greatly to help us in another way. All surgeons know the effect of Trendelenburg's position in keep-

ing the intestines out of the way during operations in the pelvis or lower part of the abdomen. Why should not this same influence be made use of in preventing postoperative adhesion? I am accustomed to elevate the foot or head of the bed, according to whether the operation has been in the upper or lower part of the abdominal cavity. After all operations in the pelvic cavity or lower abdomen the foot of the bed is elevated for the first three to five days and, if the operation be on the biliary passages or stomach, the intestines are gravitated away from the region of the operation by elevation of the head of the bed. I have never seen any embarrassment of respiration or the heart's action as a result of this practice, and, if any such trouble should occur, it would be a very easy matter to lower the bed to the horizontal.

This method of gravitating the abdominal contents away from raw surfaces I have not seen used or mentioned by others. Repair is so rapid with serous surfaces that if immediate contact and adhesion can be prevented the chance of formation of firm adhesions is much reduced. It has seemed to me that this plan alone has been an important factor in my success in abdominal work.

Avoidance of flatulence is a highly important matter which is about half accomplished when the bowels are thoroughly cleared out by the cathartic before operation. I believe that calomel is of value in these cases not only as a purgative but that when decomposed by the intestinal juices it has antiseptic value. Some would possibly attribute this to free flow of bile, but, from whatever reason, I feel quite confident that the result is the same. In addition to the thorough emptying of the bowel of materials which could ferment or decompose and cause intestinal gases, it is important to stimulate peristalsis, as far as possible, so that the gases and intestinal contents shall be carried on and make their escape in the natural way. I believe that the routine use of small doses of strychnin is of great value in promoting peristalsis. Eserin in combination with the strychnin is of aid in stimulating contraction of unstriped muscle fiber of the intestines. The use of easily di-

gested foods or even none at all, thus preventing fermentation during the first few days, is also of importance. Albumin, the meat juices, broths, malted milk or peptonoids, if used in small and frequent amounts, are quite sufficient to keep up the nutrition and strength of the patient. Rectal feeding may sometimes be resorted to if it seems desirable to give nothing by mouth. The various digestive ferments are of doubtful value but are probably not harmful and may be used by those who feel confident of their good effect. In some cases in which there is a decided tendency to flatulence, which is known before the operation, it is desirable to use intestinal antiseptics such as salol or the sulfocarbolates in connection with cathartics for some days before operation, as suggested by Kocher for stomach and intestinal surgery. The mouth and digestive tract may be rendered practically sterile by special attention to the teeth and the use of sterilized foods as is Moynihan's practice. No factor is of greater importance than the avoidance of morphin, but this has been so frequently emphasized that it seems unnecessary to say anything further about the harmful effects of morphin in these cases. When intestinal gases do form in a troublesome way, even after the foregoing precautions have been taken, much can be accomplished by the prompt and persistent use of turpentine stupes and enemas containing turpentine or asafetida. I have emphasized the influence of flatulence in the formation of adhesions, for not only does the increased intraabdominal tension tend to produce adhesions, but the glueing together of intestines when overdistended is specially liable to cause obstruction.

Keeping patients in bed for long periods renders all digestive functions inactive, makes peristalsis sluggish and in this way indirectly favors adhesions. By using muscle splitting or muscle retraction incisions, the value of which I have elsewhere repeatedly emphasized, patients can be got out of bed in ten days or less after practically all abdominal operations, without danger of ventral hernia and with greatly reduced danger of all postoperative

complications, including adhesions. Among many other valuable contributions the Mayos have shown the needlessness of prolonged stay in bed after abdominal operations.

It has sometimes seemed to me that there is a tendency in some clinics to seek new methods, to get results that might be more certainly obtained by careful attention to details of the older well-tried ways. In any case, it would seem that fundamental questions should receive our first attention.

That little attention has been given to this subject is evidenced by the fact that no special mention is made of it in most of the recent textbooks on abdominal surgery, although the details of many rare and useless operations are included in some cases. Yet, in these days, when the abdomen is so frequently opened for the relief of conditions, which do not in themselves threaten life, neglect of any precautions which make for complete and permanent recovery seems absolutely unjustifiable. If the abdomen be opened for the removal of a small ovarian cyst or the correction of a uterine backward displacement and the patient be left with abdominal pain from adhesions, which is as bad as the discomfort of the pathologic condition corrected, what is gained? Surgery has reached a degree of perfection in which we can reasonably expect not only recovery after all uncomplicated abdominal operations but speedy convalescence, and as a rule, freedom from postoperative discomforts.

No operation should be considered successful if the patient is left with more or less constant pain, constipation, indigestion or other disturbances as the result of adhesions. The number whose sufferings are so great that a second operation seems necessary for their relief is fortunately not very great, but from personal experience in many hundreds of abdominal operations I feel convinced that such trouble is avoidable in all uncomplicated cases. Not only these extreme cases of trouble from adhesions but many others in which the full value of operation has failed to be realized might usually be avoided by faithful observance of the general details mentioned.

## THE SOLUTION OF THE PROPRIETARY MEDICINE QUESTION.<sup>1</sup>

### A Study of Materia Medica Monopoly in Its Relation to Medical and Pharmacal Practice.

BY

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It has been realized by those teaching materia medica that the first requisite in the movement for raising the practice of pharmacy and drug therapeutics to their proper places as branches of medical science and practice is to establish standards for the purpose of securing uniformity in character, quality, and strength of materia medica products; and the second requisite is to place the maintenance of these standards in the hands of persons who are trained by education and experience to select, prepare and compound medicines to meet the requirements of rational drug therapeutics. Therefore the necessity of a profession of pharmacy and cooperation between the medical and pharmaceutical professions in the work of standardization.

Fresh interest has been given to the subject of standardization by the passage of the National Food and Drug Act, of June 30, 1906, by which the United States Pharmacopeia originally devised and decennially revised by a committee appointed by a congress representing the medical and pharmaceutical professions, has become legalized as the National Standard.

Standardization by chemical assay was greatly extended in scope by the Pharmacopeial Convention of 1900, and the tendency is to further extend it as satisfactory assay methods are devised. The physiologic testing of certain potent drugs which do not admit of standardization by chemical assay is yet in its infancy, but the field will be developed and become of great importance to the medical profession when pharmacologists are properly encouraged to enter it.

The standardization of materia medica includes the selecting of medicinal drugs and

<sup>1</sup> Read before the annual meeting of the American Therapeutic Society, Washington, D. C., May 7.

chemicals, and their preparation in pharmaceutical forms, aided by the arts of pharmacy, pharmacognosy, and pharmacodynamics. It includes the study of the source or genesis of the substance used as medicine, a study of the physical, chemical, and physiological properties and therapeutic effects, and the classification of this knowledge in scientific forms that it may be taught to the medical and pharmaceutical professions and freely employed by practitioners.

It is evident that the maintenance of standards and the physiologic testing of drugs requires instruments of precision and their use by trained persons skilled in their application and provided with proper laboratory facilities. All of this adds to the cost of manufacture but renders the products of far greater efficacy in the treatment of the sick. Therefore the medical profession should discriminate in prescribing in favor of those brands which have been prepared by pharmacists and manufacturers who comply with the requirements of standardization, even though by so doing the cost of medicines is somewhat augmented to their patients.

One of the most important branches of pharmacologic practice is the introduction of new materia medica products to science and brands of the same to commerce. It is impossible to disassociate science from commerce in this connection, as some have proposed. The attempt to divorce them has resulted in injury to both. Therefore materia medica commerce as well as materia medica research should be under professional control.

For the introduction of new materia medica products to science it is necessary that the knowledge developed by original research and impartial discussion shall be reduced to law, embodied in system, protected by changeless nomenclature and disseminated to the medical and pharmaceutical professions by the educational machinery of the professions, including the professional societies, colleges, and press. This is impossible under existing conditions.

Limiting the introduction of new materia medica products to the pharmacologic depart-

ments of the universities has been suggested as a remedy. This does not seem to be practical or wise. The principle upon which medical practice in all its departments is founded is fraternal and co-operative. Those who practise the medical arts are bound by professional or fraternal obligations requiring them to report the results of their observations and discoveries to the common fund of knowledge. Persons who are not willing to conform to these professional and scientific requirements should not be permitted to practise the medical arts or to invade the field of materia medica. For that reason the practice of pharmacy as well as drug therapeutics should be restricted to properly qualified and licensed practitioners, whether the practice is carried on individually or cooperatively in connection with large manufacturing houses engaged in the chemical and pharmaceutical industries.

It is even more important that manufacturing houses should be licensed than individual practitioners. It is necessary that manufacturing houses should exist. Many of the products of materia medica cannot be economically prepared except on the large scale. The standardization work required by the Pharmacopeia is impractical except when carried on by trained experts provided with laboratory facilities and time to devote to it, and the expense involved is prohibitive except when large quantities are manufactured. The results of the original researches conducted by the experts employed by the manufacturers should be donated to science.

It has been objected that the evidence of experts working for pay is not disinterested; therefore the pharmacists and manufacturers should not be admitted to fraternal relation with the medical profession. This objection is illogical unless the materia medica supply business is to be taken over by the State. This plan has been advocated by some, but it does not seem to be calculated to advance the cause of pharmacologic science and arts. Governmental regulation of pharmacologic practice is doubtless conducive to public welfare, but a socialistic scheme which places the burden of expense of carrying on the drug business upon the

tax payers can only result in hinderance to progress.

Recognizing the advantages to be obtained by cooperation between the medical and pharmaceutical professions and the manufacturing houses engaged in the chemical and pharmacal industries, a number of persons representing these several factors have for many years advocated the organization of a society, or bureau, for the purpose of associating the professional and commercial elements of pharmacy and medicine in a plan for investigating and classifying the newer *materia medica*. The plan includes the employment of *materia medica* experts by the manufacturing houses and their organization into scientific departments consisting of persons skilled in pharmacy, pharmacognosy, pharmacodynamics, and drug therapeutics, and the association of these departments in a national organization, having as its object the promotion of progress in the science of *materia medica* and its associated arts. It is proposed that this national society should devote itself to original *materia medica* research by means of the working bulletin system. The money for carrying on the research work was to be contributed by the manufacturers of the new products and the results contributed to science. It was soon found that this plan could not be carried out if the products themselves are subjects of monopoly. Scientific men found it impossible to do the work of research on monopolized products without being drawn into controversies between rival commercial houses. This demonstrated very clearly the necessity of reorganizing pharmacologic practice from a commercial to a professional vocation.

This plan was presented to various medical and pharmaceutical societies and greatly modified until at the present time two organizations exist resulting from this work, known respectively as the Council on Pharmacy and Chemistry of the American Medical Association, and the American Pharmacologic Society. Neither of these modifications reaches the ideal of the original plan, but it is hoped that they are steps in the way of its final accomplishment.

The object of the American Pharmacologic Society is to associate physicians, pharmacists and manufacturers of *materia medica* products in an organization for the promotion of progress in *materia medica* science and in the practice of the arts of pharmacy and drug therapeutics. As the pharmacologic arts deal with material substances which must be dealt in commercially as well as professionally the question of protection of capital invested in the *materia medica* supply business demanded consideration. Study of this phase of the subject developed the fact that the Constitution of the United States gives Congress the power to promote progress in science and useful arts by granting authors and inventors for limited times the right to prevent others copying their respective writings and discoveries. On this clause in the Constitution our patent and copyright laws are founded.

Physicians and business men associate themselves for the writing and publishing of books and protect their business by copyright. The copyright promotes progress in the writing and publishing of medical books, and if the patent law is properly applied to the manufacturing of *materia medica* products it is equally capable of promoting progress in *materia medica* science and arts. The law provides that, "Any person who has invented or discovered any new and useful art, or any new and useful improvement thereof not known or used by others in this country, or patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, may upon payment of the duty required by law and other due proceedings had, obtain a patent therefor."

In attempting to carry this plan into application it was found that the custom of granting patents for new *materia medica* products obtaining in this country made it impractical. It was also found that a misunderstanding exists in relation to trademarks. Names are registered in the Patent Office as trademarks but *used* as identifying or specific names of new *materia medica* products. The function of the trademark being to distinguish between

brands it is evident that this is a misuse of the trademark system.

By referring to the report of the commissioners appointed to revise the statutes relating to patents, trade and other marks, and trade and commercial names under Act of Congress approved June 4, 1898, it will be found that new materia medica products are excluded from patent protection in most foreign countries. They are excluded in Germany, France, Austria-Hungary, Italy, Japan, Denmark, Norway, Sweden, Portugal, Russia, and a number of other countries. This exclusion does not generally extend to patents relating to processes or apparatus for their manufacture.

The same authority states that any article of manufacture, unless it be protected by a patent, may be made and sold by any person.

As stated by Browne, on trademarks (sec. 240), "When a new preparation or compound is offered for sale, a distinctive and specific name must necessarily be given to it; and that name no matter when or by whom imposed, becomes by use its proper appellation, and passes as such into our common language. Hence, all who have an equal right to make and sell the article have an equal right to designate and sell it by its proper name, the name by which alone it is distinguished and known, provided each person is careful to sell the article as prepared or made by himself, and not by another."

The correctness of this statement was confirmed by the decision of the Supreme Court of the United States in the Singer Sewing Machine case decided in 1895. The decision reads as follows: "The result then of the American, the English, and the French doctrine universally upheld in this, that where during the life of a monopoly created by a patent, a name, whether it be arbitrary or be that of the inventor, has become, by his consent, either express or tacit, the identifying and generic name of the thing patented, this name passes to the public with the cessation of the monopoly which the patent created. Where another avails himself of this public dedication to make the

machine and use the generic designation he can do so in all forms with the fullest liberty, by affixing such name to the machines, by referring to it in advertisements, and by other means, subject, however, to the conditions that the name must be so used as not to deprive others of their rights or to deceive the public, and therefore that the name must be accompanied with such indications that the thing manufactured is the work of the one making it as will unmistakably inform the public of that fact."

In spite of these decisions foreign manufacturing houses are bringing suits against American manufacturers to prevent them from using the names of patented synthetics after the patents have expired; and American manufacturers are constantly suing each other for infringement of trademarks when alleged infringers are acting well within their rights. How can the manufacturing houses expect to secure the cooperation of the educational interests of pharmacy and medicine when such a condition of affairs exists? The plan of the American Pharmacologic Society, designed to secure such cooperation, can readily be carried out when conditions are changed so as to make such cooperation possible.

The plan of the society provides for the establishing of standards to determine the identity, character, quality and strength of new materia medica products, and the joint maintenance of such standards by professional and commercial interests. It provides that so long as the products are manufactured in accordance with the by-laws of the society, the manufacturers shall have the privilege of marketing the same under the auspices of the society: "If at any time a product on the market under the label of a member of the society shall be found to differ in identity, quality or strength from the standard under which it is first offered for sale, the manufacturer shall be notified and shall call in the lot bearing the lot-number of the sample examined. Failure to do this shall be a misdemeanor and the offender shall be dealt with according to By-Law 4, Section 2."

The By-Laws provide that, "No paper,

report or abstract, or other communication, either written or verbal, shall be submitted to or received by the society which relates to any secret medicine, or method of treatment," and that, "No statement shall be published by a member of the society in relation to any materia medica product, pharmaceutical preparation, or method of treatment, which shall not accord with the facts relating thereto as far as obtainable. The issuing of false publications, garbled quotations, or misleading statements of any kind in regard to medicine is justly characterized as a crime against humanity and a high misdemeanor. Members guilty of this crime shall be tried by a court appointed by the society and may be expelled from membership."

This plan opens a new field of work for the graduates of the pharmacologic departments of our universities where they can obtain a livelihood in the practice of their profession. As stated in the By-Laws, "The object of the society being to promote original materia medica research, the dissemination of knowledge, and the standardization of medicinal drugs, chemicals, and preparation of the same, the society shall have the right to employ its members to conduct investigations for pay, also the right to receive contributions from manufacturers for carrying on such investigations. To insure their fairness the Board of Directors shall send all manuscripts to the Advisory Council of the society before publication in permanent form for approval. If a member of the Advisory Council shall object to any statement made in a manuscript, his objection shall be submitted to the entire membership of the Council, and the statement shall not be published if the objection is sustained by three members of the Council."

The society does not constitute itself either judge or jury. It does not attempt to pronounce therapeutic verdicts. It does not endorse new materia medica products nor proprietary medicines. The function of the society is to collect and publish evidence. The society consists of professional and commercial men bound together by mutual agreements to pub-

lish evidence in an impartial manner. The plan recognizes that the evidence of introducers is liable to bias on account of overenthusiasm. This applies to the introducers of new methods of treatment and new surgical operations as well as to the commercial introducers of materia medica products. But the evidence of introducers properly censored and verified by professional societies, reduced to law and embodied in system, constitutes the science of medicine. What is needed to give value to the evidence of introducers is proper censorship and verification. This is provided for in the plan of the society by its working bulletin system of collective investigation which places the censorship of what is to be published under professional control.

Cooperation between the society and American Medical Association council has been suggested, as both are working toward the same end, though by very different methods. The object of the council is not to cooperate with the introducers of new materia medica products in their work of introduction, but to criticize the claims made in their advertisements.

The council deals with advertised materia medica products irrespective of patents or trademarks. It accepts monopolized materia medica products in its list of censored products as ethical for physicians to prescribe. As the medical profession has stood against materia medica monopoly for centuries this endorsement is not in accord with the code of ethics.

The council being a secret commission the results of its work are not scientifically available. If the plan of the council and of the society can be so modified as to secure cooperation it would doubtless be beneficial to all concerned. What the medical profession desires most of all is an impartial discussion of the therapeutic properties of the newer materia medica. Such discussion is impossible until the products are set free from commercial control, and the brands of the manufacturers are marketed in accord with the scientific and professional requirements. It is evident, therefore, that to secure cooperation the plan of the council must be open so as to enable the profession to

determine the personal equation in regard to the investigators; and whatever is found necessary to perfect the plan of the society must be accepted. As both plans are tentative, whatever modifications are suggested will doubtless be welcome.

The first working bulletin of the National Pharmacologic Society has been published. It deals with trichlorethidene propenyl ether, or chloral glycerolate, a definite chemical substance produced by the action of glycerin on chloral. The product is not patented. The names by which it is known are not registered as trademarks. Full knowledge of its chemical properties and methods of manufacture have been published. While it is true that the class of products to which it belongs was worked up by the celebrated chemist, Louis Henry, in 1874, much of the knowledge we now have is due to the investigation of the experts of the society aided by the commercial introducers of a brand of an elixir of the product.

It has been suggested that the society should make a complete study of trichlorethidene propenyl ether in its relations with the parent body, chloral, of which it is a derivative. Therefore the society, at the request of the commercial introducer, who made an appropriation for the purpose, entered into an arrangement with one of the most eminent pharmacologists of Europe to conduct this study. The contract by and between the society and the investigator requires that the results of the investigation shall be published in a wellknown journal devoted to pharmacology, whether favorable to the sale of the product or not. It is evident, therefore, that the plan of the society is workable.

The points which should be emphasized in this paper are: (1) Medicine and pharmacy cannot be practised as disassociated and independent professions as they are mutually dependent; (2) the practice of pharmacy should be carried on as a subordinate profession to medicine, and the pharmacists should be subjected to the same professional censorship as physicians by membership in societies which are in affiliation with the medical socie-

ties; (3) the proper practice of the pharmacologic arts requires a free materia medica and common standards, jointly established and maintained by the medical and pharmaceutical professions, and the manufacturing houses engaged in the materia medica supply business; (4) the practice of pharmacy and drug therapeutics should be limited to qualified and licensed practitioners, and the field of practice should be protected from invasion by unlicensed practitioners who set up as manufacturers and conduct their business in unfair competition.

Finally, inventors of new and useful processes and apparatus for the manufacture of materia medica products, who are duly qualified by education, training and license, and who are members of regularly constituted professional societies in good standing, should be rewarded for their inventions and discoveries by patent protection. As stated by Terril, in his treatise on patent law, "The theory upon which the patent law rests is that it is to the interests of the community that persons should be induced to devote their time, energies and resources, for the furtherance of science, the arts, and the manufactures. This was recognized from the earliest periods which can be described as civilized. It is to the advantage of the whole community that authors and inventors should be rewarded, and no measure of reward can be conceived more just or equitable, and bearing a closer relation to the benefit conferred by the particular individual, than to grant him the sole right to his writing or discovery for a limited period of time."

But as stated by the board of examiners-in-chief of the United States Patent Office, in case of Caffall MS., Vol. 18, p. 322: "It was never intended that any new composition of matter or mixture of simples should be the subject of monopoly. If rhubarb and senna, or calomel and jalap, were for the first time put together, he who should do it, whether regular practitioner or quack, would not be an inventor or discoverer under the law. If done by a doctor it would only be the exercise of ordinary professional skill; if by another, it would

be but an ignorant jumble of things having supposed virtues and benefits to be obtained by the union of known drugs."

Such preparations require no greater skill in their compounding than "the expected skill of one skilled in art," and are not patentable inventions. It is evident, therefore, that the patent law, if properly applied, cannot be used by the so-called patent medicine manufacturers to protect their secret mixtures.

## SOME CRITICISMS OF THE UNITED STATES PHARMACOPEIA.<sup>1</sup>

BY

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Since the last revision of the Pharmacopeia became official, on September 1, 1905, many and varied criticisms have appeared in the medical and pharmaceutical journals. Some of these referred to obvious and unavoidable errors which had already been detected and corrected. These were mostly of minor importance and such as will escape the most accurate proof-reader.

Another series of criticisms were directed toward the plan and scope of the Pharmacopeia and the book condemned because it did not meet the requirements set up by the critic and evolved from his concept of what the law-book of medicine and pharmacy ought to be. Both of these criticisms are welcomed by those who have the interest of the work at heart for the first aids toward technical accuracy and the other may lead to a revision of still greater usefulness.

There are, however, some critics whose writings bear internal evidence of absolute ignorance of the subject, whose lucubrations would pass unnoticed, were it not for the fact that they temporarily occupy positions which lend some appearance of authority to their utterances.

Common criticism is that "many agents have been retained that are not in general use, while

others much used, have been omitted." To one who reads the Pharmacopeia for the first time, this may seem a valid criticism. The facts, however, are these: One of the first acts of the present Revision Committee was to appoint a Subcommittee on Plan and Scope. The pharmaceutical member interrogated manufacturers and dealers in pharmaceuticals, and retail druggists, both individually and through the pharmaceutical societies; the medical member sent circular letters to all national, State, large general, and all special societies asking for suggestions, not only for additions, but equally insistent upon proposed expurgations from the Pharmacopeia. The result of their combined efforts was submitted to the Committee for vote, and it is only stating the exact facts when the assertion is made that every article there found is not only used, and is valuable from the physician's standpoint, but also that no article to which these qualifications could justly apply, at the date of this inquiry, has been omitted, save only those which are not admissible under the rules of the convention by which we were very properly guided. These rules represent the best opinion of both the medical and pharmaceutical professions, and are in consonance with an honorable and logical position. No one has any right to offer this criticism, for every effort has been made to obtain his opinion and every suggestion, no matter how humble its source, was carefully considered. It might also seem that the number of agents is too great. To this there is but one answer: This is the law-book for all physicians, no matter how narrow the field of their activity, and more than this, it is the legal authority for the whole country, and it goes without saying that the necessities as well as the therapeutics of the profession vary widely in different localities.

"More frequent revisions of the Pharmacopeia are necessary." As a general proposition this appeals to the physician, but the therapist knows full well that this would endanger the authority of the book, because time is needed for definite knowledge of the value of a substance, and this knowledge comprises

<sup>1</sup> Read before the American Therapeutic Society, at Washington, D. C., May 4, 1907.

its disadvantages as well as its advantages, and the pharmaceutical chemist requires quite as much, if not more time, to complete his information. Active work for nearly five years was demanded for the present revision of the Pharmacopeia, and that period probably represents the minimum time which could possibly elapse between revisions. The present work which has been going on for the past six months to make this volume scientifically accurate, its definitions free from any ambiguity, and its rubrics determining a standard equitable to manufacturer and prescriber, so that the pure food laws can be enforced with justice and equality, will doubtless last another six months. This question of more frequent revision has frequently been debated and decided in the negative by those best qualified to give an opinion.

A third criticism seems to be that "the time has come when the American Medical Association should take a hand in this work." The author of this has apparently never read the proceedings of the Pharmacopeia Convention, nor has he discovered that the members of the Revision Committee are elected by representatives from all medical and pharmaceutical schools and from all medical and pharmaceutical societies, with slight restrictions, and that the trustees who look after the financial interests, are elected in precisely the same way, and that the United States Pharmacopeial Convention is a regularly incorporated body, with a fixed—not migratory—habitation, and carrying out a definite policy and that policy is to present the very best possible Pharmacopeia, no matter from what standpoint one views it. The officers and members of the Revision Committee have at their disposal for this work practically all the resources which this country affords. It would not be for the interest of the Pharmacopeia were the physicians entirely in control. A comparison of the United States with the British Pharmacopeia furnishes a convincing answer. That medicine is sufficiently represented, is attested by the presence of five practising physicians and seven others who hold the degree of Doctor of Medicine on the Committee of twenty-six.

It is unnecessary to remind this society of the National Bureau of Foods and Medicines, which was designed to do for the unofficial, what the Pharmacopeia does for the official remedies. We remember what care was taken that the rights of all parties should be respected, and that the truth only should be made public concerning these remedies. We know also that a joint committee of the American Medical Association and the American Pharmaceutical Association investigated the plan, and that it was later offered to the American Medical Association for adoption and refused. It is a matter of general information that one year later it was taken up by the American Medical Association as the Council on Pharmacy and Chemistry, but the safeguards which had been so carefully and thoughtfully thrown about the working out of the problems have been omitted. So far as the results published as emanating from this Council furnish evidence, it is apparent that nothing of value can be expected from this source. If the scattered offerings of this Council are ever collected in a book, it certainly will not be a better one than any of several now extant, and quite likely it will be worse. For, in the first place, as has been pointed out several times, there is no provision, nor are there any facilities for determining the therapeutic value of any substance under investigation, and further, the character of the reports suggests doubt as to their accuracy.

I am aware that three of the fifteen members of this Council are members of the Revision Committee of the Pharmacopeia, and I am familiar with the high grade of scientific work of which they are capable. If the published reports have ever been submitted to these members, it has not been passed by their votes or they are not demanding a standard even approaching that which was determined upon for the Pharmacopeia. If this were not enough to destroy the value of any scientific conclusion which the Council is placing before the medical public, the fact that it assumes responsibility for condemnatory pronouncements, is sufficient to cloud all of its proceedings. The unfortunate showing, which the Council has

made, demonstrates the utter unfitness of the American Medical Association to undertake the far more serious work of revision of the United States Pharmacopeia. It is incredible that anyone at all conversant with the facts would have had the hardihood even to make the suggestion.

With the American Pharmacologic Society, equipped and organized, its work safeguarded by every regulation which experience can suggest, and with truth as the goal toward which all its work tends, it is an organization which is absolutely independent of all influences and which endeavors to protect the rights of all concerned, who practice the healing art. The Council, on the contrary, having proved its lack of capacity or of willingness, seems to have no further reason for its existence.

The Pharmacopeia is the product of a truly national organization and that a permanent one. In its long history it has honestly endeavored to fulfil its mission, and while all its officers and committees welcome suggestions and intelligent criticisms, it is unfair to medical science and attention should be given to undigested criticism from those accidentally occupying positions which seem to give official importance to utterances which would otherwise pass unnoticed.

## REMARKS ON CROUPOUS PNEUMONIA.

BY

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This disease is as old as the history of medicine, and has claimed for its victims the young, the adult, and the aged, since time began. Unique in the fact that, under all the varying treatments of the different ages of medicine, it still seems relentless; and treated with the deference of modern views or the aggressiveness of past days, pneumonia remains unaffected, still waging its successful war.

The pathology of this disease is so well known that I feel it would be a needless repetition for me to attempt to restate it. I am only desirous of calling attention to the fact that it was at first supposed to be a disease of the lung alone—

in other words, not a general systemic infection. The latter and correct idea was first advanced about 35 years ago by Loomis in our country and Jürgenson in Europe. They both held that, in spite of the striking symptoms and disturbances in the lung, pneumonia, correctly understood, was a systemic infection, accompanied by the congested and consolidated lung area.

They must have arrived at this conclusion through observing the clinical facts that a large consolidated area of lung tissue does not necessarily accompany a virulent type of the disease, and that a small area of consolidation may be associated with extreme prostration and death. These clinical facts, together with the knowledge that the lung may show signs of consolidation long after all other symptoms of pneumonia had disappeared, was sufficient evidence to point out the true pathologic condition. I mention this particularly, because it serves to illustrate the value of clinical and physical signs. We are prone nowadays to belittle any evidence so obtained, and to question the ability of anyone to form a correct concept of the state of things through such evidence. We believe no opinion should be risked until the microscope has been called into service, or perhaps a postmortem has been held. This may be all right and only the proper scientific caution we should display, but I feel sure, that it is a serious scientific mistake not to seek after every available clinical fact, and strive after a scientific interpretation of the same.

Pneumonia is usually stated to be a disease common to all climates and all countries. More correctly, it is a disease common to the temperate zone, but almost unknown in arctic and tropical regions. The period of greatest frequency occurs during the autumn, winter, and spring months. No age is exempt, though it is a disease of adult life; and men are more often attacked than women.

It was once believed that sudden or prolonged chilling of the body was the exciting cause of this disease, but we now know that *Pneumococcus pneumoniae* is responsible. There is abundant evidence, however, both direct and indirect,

which goes to prove the association of pneumonia with a history of a previous chilling. In what way can we explain this connection? Extreme cold produces these physiologic phenomena: First, a temporary congestion of the internal organs; second, a decrease in heart power; third, a lowering of the body temperature; and fourth, shallowed and slowed respiration.

We know that the pneumococcus is not infrequently found in the mouth, throat, and bronchi of a normally healthy person; and so far as any evidence to the contrary is concerned, they may be found in the lung itself. With this chilling process we may have these pneumococci deserting their frequented places in the throat and bronchi and following the congested tracts. From the anatomic structures we would naturally suppose the lower lobes of the lungs would furnish the seats of greatest congestions. The small capillaries might rupture and the germs be liberated around air cells, under favorable conditions for their propagation—and systemic infection result. This I mention as a possible hypothesis which might serve to explain the frequent association of pneumonia with a history of a previous chilling; and it may also serve to explain the frequency with which the lower lobes of the lung are attacked.

The variable climate is the climate particularly affected by pneumonia. Not because the germ flourishes under change, but only because a sudden chilling and congestion is so much more easily brought about. The months showing the greatest, most frequent, and sudden variations in temperature are the months marked by the short illness and sudden respite common to this disease.

Statistics prove that pneumonia has been steadily increasing in the last decade throughout the large cities of the East—New York, for instance. Why is this? Are city dwellers becoming more susceptible to this germ? Is the crowding together of so many people responsible? I believe not. Can we not explain this increase in the same way we account for the greater frequency of pneumonia during certain months of the year? It is the rule now-a-days to have steamheated houses; this

generally means a continual dry overheating and this means that city dwellers are being constantly subjected to possible chillings with the consequent temporary congestion.

As to the symptoms of pneumonia: There are comparatively few individuals who, at the mention of this disease, do not mentally call up a picture of the bedside of some friend or relative who has felt the grip of this enemy. Who is not familiar with the chill, sudden onset, fever, cough, and painful respiration?

The treatment has been everything and nothing, and the generally expressed opinion now is, that nothing is preferable to everything. In this I heartily concur if by "everything" is inferred just anything; but only so far do I agree.

Having no definite specific to rely upon, no curative agent which comes labeled "for pneumonia," shall we join the fashionable and supposedly extremely scientific, and decry all treatment?

Unquestionably such a procedure in our dilemma would prove the easiest, and we may be able to satisfy conscience and the friends of our patients. But let us hope that we will reserve such an attitude for learned discussion upon this subject rather than in a practical application upon the unfortunate.

Having no recognized specific for pneumonia—i.e., no curative agent that, independent of conditions or things, directs its force directly against the germ or toxin eliminated by this germ, have we no other scientific indication for treatment?

In any disease, there are two primal indications for treatment always to be considered. The first is that usually known as specific treatment, consisting of medicaments which supposedly have a direct influence upon the life or activity of the germ which is responsible for the individual disease. Second, medicaments, of whatever nature or kind, that have a direct influence upon the morbid conditions of the body brought about by the action of these germs.

The history of medicine for many centuries confined itself and had to do almost exclusively with this last phase. It is only comparatively recently that specific treatment has been practised

or known; and because of its comparative newness it has absorbed our attention and filled our mental vision to the exclusion of any other treatment. Frequently, the life and death of a germ or cell has come to be of more scientific importance and interest, than the life and death of the individual. It seems to me that our sense of proportions, our appreciation of the value of things, has fallen sadly in error; and we have shown precious little common sense. Take the attitude of the profession in this particular disease, pneumonia, and in a moment we see its absurdity. Here we have a disease increasing in frequency every year, a disease that furnishes the climax to many useful lives, and yet our interest goes little further than a diagnosis, and treatment is dismissed because of the lack of a specific. We believe that nature or the physical forces of the body will successfully combat the foe in some instances, in others the body must succumb. Does it occur to us that it may be possible through a proper alleviation of those morbid conditions which go to exhaust vitality that many lives that we are accustomed to place amongst the condemned may be saved? And through efforts not against the germ, but against the morbidity produced, we may successfully treat almost all uncomplicated cases.

In some cases of pneumonia the resistive forces of the body are so great, or the degree of infection so slight, till the crisis is passed that no indications for any medicaments have arisen. But this, unfortunately, is not the rule. So it is well to consider more particularly the morbid conditions usually observed in this disease, that tend to exhaust vitality and lessen the resistive forces.

The fever accompanying pneumonia, is usually high and continuous, and I am satisfied has a direct weakening effect upon the heart, beside in some sort being responsible for many nervous symptoms, which in themselves tend to exhaust the vitality of our patient.

This pyrexia, then, is a symptom which calls for attention. How shall we meet it? Shall we give a coal-tar product in sufficient dosage to reduce the temperature? No, for one of the

reasons necessitating the reduction contraindicates the use of any such antipyretic, that is, the direct weakening effect upon the already burdened heart. And this brings me to the primal object of this paper.

We have an agent that has been employed for this purpose, intermittently, throughout the last 25 or 30 years—one deserving a better reputation than it now enjoys, namely, quinin.

The first reference I have been able to find in respect to the use of quinin in pneumonia is by Jürgensen, who employed it with marked success. Loomis also recommends it. Neither of these two observers was able to discover any deleterious effects from the use of this drug, and they not only obtained a direct effect upon the temperature, but further, their pneumonia patients began to get well with very much greater frequency.

Is it possible that quinin is in some sort a partial specific in this disease? Does it have a direct inhibitive action upon the pneumococcus itself? This is my belief, and for the following reasons: First, there is no doubt that quinin will effect a reduction of temperature in pneumonia, and yet we know that this drug is no true antipyretic. It has no effect upon the temperature in health. It will reduce the temperature in malaria, and accomplishes this through its actions upon the plasmodium. It will reduce the temperature of septic infection, and must do so through a specific action upon the streptococcus. And so, reduction following its employment in pneumonia, it may reasonably follow that this reduction results from its specific action. The specific action of quinin being granted in pneumonia, the question arises, why then, after the reduction of temperature, should there be any after rise of temperature, or any further symptoms of the disease? If a moderate use of this drug will reduce the temperature and alleviate the symptoms, why not produce a complete cure by the exhibition of a large dose? This has been tried with the following results: The patient's temperature dropped to normal and to all appearances he seemed a well man. This condition lasted from about 12 to 24 hours, to be superseded by high fever

and more aggravated symptoms than at any previous time of his illness.

This result would seem to be rather unfavorable to any belief in the supposed specific action of quinin. But I believe there is an explanation for the subsequent rise of temperature and general collapse, that is not opposed to the belief in quinin as a partial specific in pneumonia.

One of the most marked and curious actions of quinin is found in its effect upon the white bloodcorpuscles. We know that they lose their power of migrating from the bloodvessel, that they are decreased as to number, and in all probability, are rendered temporarily functionless. They must lose their aggressiveness toward germs. We have by the exhibition of this large dose of quinin killed the pneumococci which are responsible for the systemic infection and disturbances, and we have at the same time rendered passive the white blood-corpuscles. The foci for a new infection exists in the pneumonic lung, and from thence comes a new invasion of the enemy, which finds the system all unprepared, for no reliance can now be put on the sluggish white blood-corpuscles and so the conditions of high fever and great systemic infection should naturally be expected:

It might be argued that in intermittent malarial fever, if the foregoing theory is true, we should expect a similar rise in temperature and a more severe chill after a large dose of quinin had been given. But there is little true similarity. For, to begin with, we know that quinin in very weak solution is extremely deadly to the plasmodium; and further, there is no focus for a second infection existing within the body, and still further, a period of 36 or 48 hours must elapse before the plasmodia which may have escaped the toxic effect of the quinin begin to give rise to symptoms. This period may be sufficiently long to allow the white blood-corpuscles to recover and again become factors of resistance.

If there is any truth in this theory, it follows that one fact must not be lost sight of in the administration of quinin in pneumonia, that is the danger of a reinfection from the consoli-

dated lung area, which we cannot reach. Particularly dangerous because we have temporarily put out of business the white bloodcorpuscles. To counteract this danger, it becomes necessary that the quinin be given continually throughout the attack. This I consider crucial. It may reasonably be objected that this treatment (the administration of quinin in pneumonia), being anything but new, it can surely possess no specific action, for certainly, in these years it would have been proved authoritative long ago. But let us remember that it was given not with any idea of specific action, but for its antipyretic action; and then consider a possible case. We have a pneumonia patient with high temperature to whom we give 1.6 to 2 gm. (25 or 30 gr.) of quinin, the temperature drops to normal and the patient seems well. No more quinin is given, for there is no pyrexia, and in 24 hours our patient has developed the most aggravated symptoms—and possibly dies. We would hesitate to use quinin again; and would ascribe any previous good results to mere luck. And this, I believe, is the real reason why quinin in pneumonia has never been generally accepted as sound treatment. All too frequently after the one heroic dose, there has been a reinfection which satisfies the doctor forever with the quinin treatment.

My own experience in the use of quinin in pneumonia extends over a period of nine years, and though the number of cases treated may be insignificant, the uniform result may count for something. The first case happened to be my only unfortunate one. The patient was a man about 55 or 60, and bedridden from inflammatory rheumatism. He had a grave organic heart lesion. I thought he would die early in the attack, but to my surprise he outlived the pneumonia, to die about four or five days after crisis from heart failure.

During this period I have had two cases of double pneumonia, two cases complicated by heart lesions, and four cases in people ranging from 55 to 70 years of age. I mention this to show that they have not all been of the mild type that is sure to get well anyway, if let alone. The number of cases is between 50 and 60. I

have prescribed quinin, in from 0.2 to 0.3 gm. (3 to 5 gr.) doses, repeated every two hours until 0.8 to 1.3 gm. (12 to 20 gr.) are taken, the amount given varying with the mildness or severity of the symptoms. Not infrequently, I have combined a minimum dose of acetanilid with the quinin. The quinin I have kept up steadily throughout the attack, irrespective of anything else that may be given; and I have yet to see the pneumonia patient upon whom it has had any untoward action, or produced other than the happiest results.

I have given quinin consistently in pneumonia believing in its specific action; but I have supplemented this with purely symptomatic treatment whenever I believed it necessary.

As to the symptomatic treatment in this disease, little can be said; not because the subject is in any way unimportant, but because of the varying conditions and patients. It would be just as reasonable for a tailor to attempt to make one garment fit all of his customers as for a doctor to treat symptomatically all of his pneumonia patients alike. In both instances alterations are necessary.

As in any disease, do not give a medicine unless you believe the indications call for it, and do not hesitate to give any medicine if you believe it indicated.

## NONDIABETIC GLYCOSURIAS.

BY

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For the sake of brevity and convenience, the term glycosuria will be used throughout this article to refer to dextrosuria not involving the metabolic and clinical features of diabetes.

1. *False Glycosuria*.—The ordinary copper solutions are reduced by uric acid and urates, kreatinin, hippuric acid, mucin, hypoxanthin, glycuronic acid, alkapton (J. Bergen Ogden and others). Ogden also mentions in this category alkaloids, arsenic, and phenol, but these will be discussed under the next heading. This false reaction may usually be distinguished from the

true by boiling the urine and the reagent separately and mixing them hot, but without further boiling. Sugar alone causes a reduction under this condition. The picric acid and alkali test may also be used to check the copper test. M. Bial<sup>1</sup> states that glycuronic acid is formed in the intestine, that it is increased by menthol, that variations in the urine depend upon variations of absorption and that it has no relation to sugar metabolism.

During the administration of salol, salacetol, salicylates, etc., the urine regularly yields a dense cloud with the copper solution. This cloud is yellow, lacking the orange tint produced by the reduction of copper by dextrose and it does not readily settle. The picronitric acid test is also negative. This reaction is probably due to salicyluric acid, since chemically pure salicylates or salicylic acid fail to react and the reaction may be ascribed to some metabolic phenomenon, since urine directly treated with salicylates does not react.

2. *Exogenic Toxins Causing Glycosuria*.—The late Chas. W. Purdy mentions in his textbook curare, carbon monoxid, amyl nitrite, methyldephinin, morphin, chloral, hydrocyanic acid, sulfuric acid, mercury, alcohol, strychnin, salicylic acid (and salicylates), turpentine, uranium nitrite, benzol, acetone, phloridzin. There may be added to this list phosphorus, cubebs and copaiba, diuretin, caffein (the last two only when the diet is rich in sugar, so that there is hyperglycemia, von Noorden,<sup>2</sup>) chloralamid, ether, and chloroform and narcotics generally.

There is considerable discrepancy of statement as to whether the reduction of copper by these substances is true or false, and whether the substances act directly or after comparatively slight modification before elimination, or whether they increase, reducing substances in the urine by their influence on metabolism or renal selective activity, in case there is no increase of the normal, practically undetectable trace of sugar. Purdy states that, in some cases, the reaction is due not to sugar but probably to glycuronic acid.

Ordinary and sometimes excessive doses of

morphin, strychnin, chloral, turpentine, hydrocyanic acid, sulfuric acid, arsenic, mercury, alcohol, amyl nitrite, diuretin, caffein, and, frequently, cubebs, copaiba, and the anesthetics, fail to produce a reduction of copper by the urine. Obviously, too, carbon monoxid and hydrocyanic acid, the anesthetics and other poisons, may cause death too suddenly to allow any effect in the urine.

In some cases, the depressants, turpentine, etc., may simply cause a concentration of urine or an excess of nitrogenous extractives, which cause a false reduction of copper.

Generally speaking, corrosive poisons, those causing fatty metamorphosis, or those depressing innervation, may be supposed to cause hyperglycemia by reducing the glycogenic function. Whether the resulting glycosuria is due to this action alone or to concomitant inhibition of glycolysis or of the local selective action of the renal cells, has not been demonstrated and, doubtless, the facts are different in different cases.

It may be stated<sup>3</sup> that the only exogenic toxin that regularly causes genuine glycosuria of considerable amount and which is, therefore, available for experimental purposes, is phloridzin. This is the only producer of glycosuria which does not cause an antecedent hyperglycemia. Rosenfeld<sup>4</sup> claimed that it caused, in animals, under certain dietetic conditions, a transient and recoverable fatty infiltration of the liver, but the evidence is plainly that phloridzin causes glycosuria by its action on the kidney, though, as von Noorden<sup>5</sup> points out, it has not been demonstrated whether the glycosuria is due to passive permeability or to increased cellular excretion. Still, diseased kidneys react to phloridzin less than normal ones, so that the latter theory is more probable.

Straub<sup>6</sup> claimed that carbon monoxid does not produce glycosuria in animals fed on carbohydrates alone, and ascribed the sugar to the breaking down of albumin. Rosenstein<sup>7</sup> corroborated this statement and limited the sugar production to products of tryptic digestion soluble in alcohol. Vamossy<sup>8</sup> further limited the source, probably, to monoamido acids.

E. Bendix<sup>9</sup> reported the exacerbation of glycosuria in a case of diabetes by the administration of chloroform and stated that in dogs on a carbohydrate diet, glycosuria may be caused by chloroform or morphin. Albert Seelig<sup>10</sup> found that hyperglycemia and glycosuria were always produced in healthy dogs by ether, unless suboxidation was prevented by intravenous infusion of oxygen.

3. *Glycosuria due to Disturbed Metabolism in General Diseases.*—Various infections, as cholera, intermittent fever, scarlet fever, cerebrospinal meningitis, as well as gout, may produce temporary glycosuria. D. Benedetti<sup>11</sup> reports a case of levulosuria occurring in pertussis. Gout, being a somewhat vague term and true gout being essentially a disease of suboxidation, it is of doubtful propriety to include this disease with the group of infections. Doubtless the glycosuria of many cases of gout is false, due to the reduction of copper by nitrogenous substances in the urine. In other cases, hepatic involvement or functional depression interferes with glycogenesis so that alimentary glycosuria readily results, while, in still others, the gout is simply the expression, mainly on the part of the liver and kidneys, of a general interstitial change that also involves the pancreas so that the glycosuria may be essentially the expression of incipient diabetes. In some cases the "glycosuria" may be suspected of being quite adventitious and due to salicylate treatment.

The diseases of this group are generally regarded as interfering with glycogenesis; von Noorden considers that, in them and in alcoholism, the glycosuria is due to disturbed pancreatic glycolysis.

4. *Central Nervous Glycosuria.*—Under this head, may be included not only Claude Bernard's experimental puncture of the floor of the fourth ventricle, and injury of the vermiform process of the cerebellum, but high section of the spinal cord, and various traumatic and succussive injuries of the head, spine, and body generally, in which an actual lesion or marked disturbance of function of the "vital centers" may be surmised. Higgins and Ogden<sup>12</sup> found glycosuria in 9.3 percent of 212 cases of head injury without

fracture and in 21.9 percent of 45 cases of fracture of the skull. Opie states that true diabetes has been known to follow such cases but rarely, so that the etiologic relation is doubtful. It is scarcely necessary to state that these reports exclude any possible immediate effect of anesthetics.

Idiopathic nervous diseases are likely to cause glycosuria. Van Oordt<sup>13</sup> found it in 12 of 75 miscellaneous organic lesions of the nervous system and in 13 of 103 functional diseases, including four of major hysteria.

Jas. Hendrie Lloyd<sup>14</sup> reviewed 36 cases in literature of undoubted diabetes in children under three and found acute hydrocephalus, tuberculous meningitis, cerebral and spinal traumatism, and heredity, as causes.

Of causes of glycosuria, not strictly centric but still acting on the liver (?) as if by stimulus from a center, may be mentioned the following: Section of splanchnics, irritation of vagi, stimulation of the central end of a large motor nerve as the sciatic.

Cerebrospinal meningitis may also cause glycosuria by centric action and the third group may affect the glycogenic function through a poisoning that directly affects the centers. R. de Campagnolle<sup>15</sup> found alimentary glycosuria in all of 10 febrile cases after the administration of 150 grams of sugar but the test is hardly strict enough and glycosuria is not common in febrile cases generally, under restricted or even fairly liberal diet.

5. *Local Interference with Glycogenesis, Causing Glycosuria.*—It is, in general, impossible to draw a sharp line between centric and local phenomena but the following may be considered as definitely local. The ligation of the accessory portal vein in animals increases the flow of blood to the liver and results in glycosuria, at least if the diet is rich in carbohydrates. It would be interesting to compare the limit of tolerance of carbohydrates in human beings before and after the operation to establish collateral outflows to the portal blood. Compression of the aorta and various other experiments may determine a glycosuria. The various organic, hepatic, and biliary affections

are rarely characterized by a frank glycosuria and this fact tends to throw doubt upon the ordinary physiologic teaching as to the function of glycogenesis. Still, all such diseases tend to favor alimentary glycosuria.

6. *Alimentary and Allied Glycosurias.*—These include all forms in which the stoking function of the liver is exceeded or passed around, as when carbohydrates are injected directly into the circulation. The latter experiments are mainly of value in determining glycolysis and the conversion of one form of carbohydrate into another and, being quite artificial, will not be considered here. In my method of subcutaneous nutrition with salines and 50 grams of glucose, three times daily, glycosuria has not been observed, doubtless on account of slow absorption and previous blood-poverty in carbohydrates.

Alimentary glycosuria normally occurs when more than the following amounts of carbohydrates have been ingested at once (von Noorden's<sup>16</sup> summary).

Starch, no limit, on account of slow conversion; glucose, 200 grams; levulose, 140–160 grams; cane sugar, 150–200 grams (saccharosuria may occur without glycosuria); milk sugar, 120 grams (corresponding to about 3 liters of milk); maltose, low limit, so that in many persons glycosuria almost always follows drinking beer; pentoses, low limit, so that nearly half is recovered from urine after administration of 30–50 grams. Many persons exceed these standards of tolerance. For instance, I have frequently noted an entire absence either of saccharose or dextrose, after the ingestion of a pound of candy, even when the diet had previously been rich in carbohydrates.

Any of the other causes of glycosuria tend to exaggerate an alimentary glycosuria and, indeed, if of mild degree, may appear only as alimentary glycosuria. In hepatic sclerosis, biliary obstruction, ascending infection, etc., the disturbance of glycogenesis is particularly marked for levulose. Von Noorden<sup>17</sup> states that after administering 100 grams, 1 to 20 grams may be recovered in the urine and that many persons excrete sugar after taking 60 grams. Krause<sup>18</sup> found levulo-

suria in 80 of 100 patients with liver disease and in only 20 percent of normal individuals.

7. *Glycosuria Especially Connected With Certain Organs.*—Under this head, may be considered pregnancy and lactation, thyroid disease, especially supersecretion, and the action of suprarenal extract, not to mention true pancreatic lesions, which may be considered strictly diabetic, even when the glycosuria is slight. Lactosuria or even dextrosuria is fairly common late in pregnancy and during lactation, especially when the milk is not used. These conditions are probably due to direct absorption of lactose and hence, in analogy with those mentioned in the last group.

True glycosuria of pregnancy is also quite frequent though of mild degree. It may be explained as toxemic, due to the fetus, to maternal, renal, or hepatic disturbance or to accidental gastroenteric affections; as a reflex nervous disturbance of glycogenesis or even glycolysis; as a more or less mechanical disturbance of portal circulation and, consequently of glycogenesis; or due to concomitant disturbance of the thyroid function, some degree of which is almost always present. The mere cessation of menstruation may operate to cause metabolic disturbances, including those relating to carbohydrates. It is by no means certain that any one of these explanations is always operative. It is also obvious that anxiety, and nervous and physical strain due directly to pregnancy may act as the exciting cause of true diabetes.

Diabetes is occasionally associated with exophthalmic goiter. Hanseemann<sup>19</sup> collected 15 such cases. Temporary glycosuria is frequent in exophthalmic goiter.<sup>20</sup> Chvostek<sup>21</sup> estimated that 69 percent were attended with alimentary glycosuria. Strauss,<sup>22</sup> however, found it in only three of 19 cases. Bettman<sup>23</sup> considers glycosuria as characteristic of thyroidism in general, including that due to administration. Von Marvin<sup>24</sup> administered about two grams of extract daily for eight days to 25 healthy persons and found glycosuria only in two.

The suprarenals have not so marked a relation to glycosuria. Tyson's "Practice" does not even allude to glycosuria as a symptom. Blum<sup>25</sup>

produced glycosuria by injecting extracts and discusses suprarenal diabetes. Herter and Richards<sup>26</sup> have produced glycosuria by injections either into the general circulation, peritoneal cavity or by painting the pancreas. Such experiments, however, involve the element of mechanical insult and of exaggerated, local action on the blood supply and functional activity of the pancreas. I have for about five years used adrenalin for gastroenteric hemorrhages and as a general cardiovascular tonic, almost to the exclusion of digitalis, and I have never observed glycosuria, although no very systematic examinations have been made. Neither is glycosuria common in spontaneous suprarenal disease.

I feel that the frequency of nondiabetic glycosuria has been overestimated and, likewise, the frequency of alimentary glycosuria in diseases of the alimentary canal and liver. In about 500 insurance examinations and 3,000 examinations of urine in private practice, 75 percent of all cases being strictly digestive-organ cases and 25 percent strictly digestive abnormalities, nondiabetic glycosuria has not been found unless explained by excessive ingestion of sugar. Three cases of Addison's disease, 10 of Graves' and several of pregnant and nursing women are included but none of head injury. This statement should be qualified as follows: the precipitate after salicylates has been ignored and the urine has been subsequently tested after the absence of salicylates has been established by ferric chlorid; other drugs previously mentioned have rarely required consideration but sugar has been found absent in morphin, strychnin and arsenic poisoning and after medicinal doses of most of the drugs mentioned as likely to cause a reduction of copper; precipitates of phosphates, decolorization of copper solution, greenish-yellow tints that can usually be produced by adding an excess of urine, and the appearance due to the use of spoiled copper solutions have always been disregarded and any suggestion of sugar has been checked by the picronic acid test, fermentation, etc. I do not wish to be understood as doubting the occurrence of nondiabetic and nonalimentary

glycosuria, but I am certain that the idea that such cases are at all common rests on errors of technic or, at most, the inclusion of slight and normal traces of sugar, as glycosuria.

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THE EYE: FROM THE GENERAL MEDICAL  
POINT OF VIEW.\*

BY

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If the full effects of a particular disease could be traced, probably every tissue would reveal the sinister touch of its particular pathology. Intercommunication is reliable and swift, and following in its wake come the products of pathologic physiology, to depress the tissues and bear substantial testimony to an altered function and a suffering organ. The depression of remote tissues may be so brief and so slight that it has passed before it can be assigned a place in the

symptom group. In the other extreme, it may be so great that it overshadows at times the original lesion, as in the gastric crisis of locomotor ataxia or the yellowish tinge to the skin following catarrh of the duodenum. There is a space between these two extremes which is not entirely filled with knowledge.

A disease may represent the center of a circle, and small arcs on the circumference, all the tissues of the body. Thus we might tentatively place nephritis in the center and let each radius running from it terminate, and tell of the effect, upon the heart, the liver, the lungs, the eye, and the lymphatics, etc., and if we could multiply the number until each organ or system had been drained of its crucial changes we would have a picture, the study of which would preclude a mistake in diagnosis, because the picture would be the diagnosis. The name for it would be but a convenient title, even as pictures in the art galleries are known by their titles.

It is of interest to note that each one of the 12 main divisions of diseases (running the whole gamut from those due to animal parasites to those of the nervous system) has at one time or another been placed in the center of the circle and questioned as to its relation with eye pathology. This does not carry the implication that even the majority of the subdivisions are held to be blamable, as far as our present knowledge is concerned, nor does it mean that I will recount more than will serve to illustrate my point of view.

In diseases of the blood and of the circulatory system, the eye is a potential field of information. In the examination of this fluid tissue and of this system we listen to it a little to the right of the left nipple line, and we feel it at the wrist and take away drops of it for observation and various tests. By instruments its power is noted and in old men we incidentally get partial shadows of it while taking some of the röntgen-ray pictures. If there is then inserted a strong convex lens between the pupil and the ophthalmoscope there will be seen a bright yellowish-red background and resting upon it a terminal artery and the beginning of a vein; an integral portion of the system we are studying

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actually at work in its own home. If there is a general change in the circulatory system, this terminal artery and this vein will not be slighted.

In arteriosclerosis a retinal vein cannot be seen through the artery which crosses it, as formerly, because the latter has lost its translucency. There will also be found white stripes in the walls of the vessels where degeneration exists. In mitral disease (and in other conditions in which there is a damming back of the blood from the head, as in emphysema or even in violent cough) the retinal veins are engorged and stand out big and thick compared with the retinal arteries, which have not undergone such radical change in size. Endarteritis may bring with it hemorrhagic retinitis, where the degenerating walls of the retinal vessels have given way. In this same disease of endarteritis there may be black specks floating across the yellowish-red reflex, and the patient sees them also and speculates as to cataract, whereas they are floating opacities in the vitreous. Then again, a patient with arteriosclerosis, or with aneurysm, or with valvular disease of the heart, is suddenly deprived of his sight. A small fragment has broken loose from its mooring and traveled with the circulating blood until it has plugged an artery through which it could not pass. In this condition the ophthalmoscope may reveal an embolism in the retinal artery.

Under so-called diseases of the urinary organs, the inflammation of the retina occurring with nephritis is at once a valuable and an unfavorable sign. It is a sign which may perhaps be uncovered while making an unbiased ophthalmoscopic examination. The specialists tell us that two years after it is seen more than a slight majority of the patients are dead, and some would even make the number greater than I have mentioned.<sup>1</sup> Here then is a finding of definite value in diagnosis and prognosis.

In diseases of the digestive system, constipation has been held responsible for some of the cases of recurring styies; portal congestion for opacities in the vitreous.

It is of interest to note that in constitutional diseases, as gout and rheumatism, there is frequently associated a conjunctivitis, probably

due to vasomotor disturbance. In rheumatism we also have occasionally to contend with keratitis and optic neuritis. There is another class of constitutional diseases, especially in children, in which there is said to be a "depressed nutrition" or a "strumous condition" or "the general health is not good." It would seem as though all the organs were being as evenly depressed as the constituent parts of Oliver Wendell Holmes' celebrated "One-Hoss-Shay." Or it may be no organ wishes to cry out for help for fear that it may be held responsible for the entire trouble, while its equally culpable associates escape the odium of censure. Be that as it may, in these cases in children the cornea tends to become involved. It will be remembered that the cornea is a nonvascular structure and has to rely for its nourishment on the courtesy of neighboring vessels.

Under the group of intoxicants, we find the baneful effects of both wood and ethyl alcohol, as well as lead, in the production of blindness through optic neuritis. A heavy user of tobacco will come to the physician complaining that he cannot see as well as formerly, and he is found suffering from dimness of vision without visible changes in the eye—amblyopia. Large doses of quinin have caused total blindness, from which gradual recovery may take place, but probably never to quite the normal limits.

In the specific infectious diseases we find keratitis frequently following measles, and choroiditis has here to be also taken into the reckoning. Conjunctivitis often adds its mite to the symptom group of smallpox and scarlet fever. As a sequel to diphtheria, usually during the second or third week of convalescence, 10 to 15 percent of the patients have a local paralysis. This occurs oftener in the palate than elsewhere. Next to the palate, the most common site is paralysis of some of the muscles of the eye, due to toxic neuritis of the third nerve.<sup>2</sup>

Tuberculosis manifests itself in various portions of the eye. The ravages of gonorrhea in the eye through external infection are well known. Probably the metastatic infection of the iris through urethral gonorrhea is not so well known.<sup>3</sup> It is apt to make itself manifest in

those cases in which there is articular involvement due to gonorrhea. The metastatic infection of the eye in obstetrics and surgery has also had the earnest attention of our friends, the ophthalmologists.<sup>4</sup>

Of all diseases which we can place in the center of our circle the one which stands out most clearly as a causative agent of eye pathology is syphilis. Beginning at the eyelids and going back through the conjunctiva, the cornea, the iris, the ciliary body, the vitreous, the retina, the choroid and the optic nerve itself, we find the ugly touch of this social plague. Through gumma of the brain, the muscles of the eye may be rendered helpless by pressure on their paths of innervation embodied in the third, fourth, and sixth cranial nerves. Not that every syphilitic has all or even one of these eye conditions, because no disease is uniform in its course. Were it so, medicine would rank with mathematics, and simple computations would take the place of masses of minutiae in building up a diagnosis; nor, on the other hand, are we debarred from using mathematics where we can. A patient may come to us complaining of uncertainty of vision, and he thinks it must be caused by his liver because his eyes have acted queerly before when he was "bilious." Perhaps in different language we concur in his diagnosis or perhaps among our findings in the eye there will be a picture which resembles nothing so much as a dark red ball of clay, which being thrown against a yellowish-red wall has stuck until the center partially dropped away and left the rest of it sprawling there. Having found this peculiar distortion of the optic disc, we are minded to say he has optic neuritis and then we go forth groping for a cause and find that he had the initial sore of syphilis two years before.

At least three of the diseases of the nervous system have a diagnostic sign in the eye. Locomotor ataxia presents the Argyll-Robertson pupil, which contracts for near work but not for light. The diagnosis of hereditary ataxia (Friedreich's ataxia) is based on a group of symptoms of which one is the clonic rhythmic spasm of the external muscles of the eye known

as "nystagmus." Multiple sclerosis is diagnosed by its volitional tremor, scanning speech, and nystagmus. Hysteria, progressive paresis and tumors of the brain have each their eye manifestations.

And, lastly, if we enter the psychic arena we find the eye helping to express the mental state in happiness and in sorrow, in fear and in endurance. We find it steady with latent power in one patient of intellectual force, and shifting and weak in the incipient decay of another's will. And if a man is a general practitioner, studying the life problems of his patient, as well as his altered metabolism, these things, too, must add their quota to the diagnosis-picture.

In determining the relation between a given organ and the rest of the body, the foregoing alone would be incomplete. The remainder is obtained when the eye is taken from the circumference and placed in the center; when it ceases to be a partial index of other disorders and becomes the aggressor. Just what is this morbid influence through which the eye can effect the circumference? It is the pathologic physiology represented by errors of refraction, sometimes accompanied by muscle imbalance. It is eyestrain.

It was my good fortune while serving on the staff of the Episcopal Eye, Ear and Throat Hospital of this city to examine 422 patients with special reference to their vision. Some of my findings I have noted in the following table:

Unaided vision in the right eye was better than the left in 22 percent, or 94 patients, of which number 52 had vision of 20/20 or over.

Unaided vision in left eye was better than the right in 36 percent, or 151 patients, of which number 77 had vision of 20/20 or over.

Unaided vision was the same in each eye in 42 percent, or 177 patients, of which number 86 had vision of 20/20 or over.

Both eyes had the same type of error (excluding presbyopia) in 79 percent, or 333 patients.

Each eye had a different type of error in 17 percent, or 73 patients.

Presbyopia, without other refraction error, was found in 4 percent, or 16 patients.

The following shows the relative number of the different errors of refraction in those whose eyes have the same type of error:

	Percent.	No. of Patients.
Without error (emmetropia), . . . .	3	10
Hyperopia, . . . . .	41	136
Hyperopic astigmatism, . . . . .	16	53
Compound hyperopic astigmatism, . . . . .	22	74
Myopia, . . . . .	6	21
Myopic astigmatism, . . . . .	5	17
Compound myopic astigmatism, . . . . .	4+	14
Mixed astigmatism, . . . . .	3—	8
Total, . . . . .	100	333

Presbyopia, with other refraction errors, which are included in the above list, 56 patients, making the total number of presbyopics 72.

Vision was tested under homatropin in 72 percent, or 303 patients; 86 percent of this number were also examined with the retinoscope, being 263 patients.

These patients include old and young, black and white, and male and female, and the data was obtained in the majority of instances in the following manner:

A patient coming to the dispensary for the first time and apparently having an error of refraction, the vision was ascertained and he was told to report back early on the other afternoon in the week. At that time homatropin hydrobromate, grain one to the dram, was instilled in each eye. Starting an hour before my arrival, one drop was inserted at 10 minute intervals until each eye had received six drops. He was then taken into the dark room and examined at one-half meter distance with a plane mirror retinoscope. This is an exact, objective, mathematic method of determining pathologic departures from the physiology of the eye. The pupil being dilated and the accommodation paralyzed it made any necessary ophthalmoscopic examination easy at this time. He was then tested with the cards and lenses. Although the effects of homatropin wear off in less than two days, it seemed best not to have him return on the other day that week, but to report back on the same day the following week. The accumulated data was then used in giving a final test and the glasses ordered. He was to secure the glasses the next day and wear them, and report back in two weeks with them. There were 159 patients out of the 422 in whom, it seemed to me, unnecessary to adopt the full

method and it was curtailed in varying degrees with them. On the other hand, it was occasionally found that the homatropin had not sufficiently conquered a stubborn ciliary muscle and the patient was later given atropin.

My thanks are due to the specialist, Dr. Belt, the ranking officer on the staff, for the opportunity of serving these patients, and to him and the other members of the staff, Dr. Griffith and Dr. Lamb, for their aid in acquiring other clinical facts.

In looking at the foregoing figures it would seem that what might first attract attention is that 86 of these patients, or 20 percent, had normal vision in each eye, and yet I found but 10 patients who had both eyes normal. There were 129 other eyes, distributed among patients whose vision was unequal, which had normal vision; and yet I found but seven eyes divided among seven people which were normal. Now how were those eyes obtaining this normal vision? By working beyond their physiologic capacity by straining. And can we in safety say that this straining was only confined to them? Were not those in which the vision fell below normal not only making a greater effort against greater difficulties to accomplish normal vision and without the satisfaction of success? It has been interesting to note that sometimes after the use of homatropin patients have stated their eyes felt better, due to the rest received while lying in splints for two days.

Out of the great mass of material which has been written on eyestrain, Dr. Gould apparently stands first as our most prolific and, with his clear diction, most interesting writer of all those who have treated of this subject. It must not be forgotten, however, that 31 years ago Dr. S. Weir Mitchell called attention to eyestrain in its morbid effect upon the rest of the body, and he was probably the first who did so.<sup>5</sup>

Dr. Gould tells us that eyestrain is the greatest cause of inflammatory disease of the eye itself.<sup>6</sup>

The most important radius which we can follow to the circumference, when the eye is in the center, is that leading to the nervous system. It must be remembered that we have a constant drain on this system in helping the eye to cover

its deficiencies, and further that the nervous system cannot show constant favoritism to one organ without its own and other systems suffering.

Thus we find eyestrain a causative agent in many cases of occasional headache, constant and in that peculiar, periodic and painful affliction known as "migraine" or "sick-headache." This last trouble frequently comes to those of a highly nervous organization, especially if they are men and women of education and culture, who not only read and write a great deal, but demand of their eyes a clear transmission of what can be seen, even as they demand of themselves and receive from their associates a clear mental picture of a subject. If reference be made to the figures given, it will be seen that in 17 percent, or 73 patients, the type of error was not the same for each eye. One might, for instance, be far-sighted and the other astigmatic. Only in seven of this number was one of the eyes normal. Imagine for a moment one eye attempting to overcome its error and passing its result, such as it may be, back to the brain only to meet the result which another eye has acquired while struggling with a different type of error, and then the two are to form one picture. Is it any wonder that the owner is disgruntled and forces them to do their utmost at all times. It is perhaps fair to suppose that this constant insidious strain eventually produces a little irritation which grows and grows and finally culminates in a nervous storm so great and so far-reaching that the eyes and head and digestive system are all involved. Those who are interested in seeing how much Dr. Gould considers eyestrain as a factor in marring the happiness of men will find melancholy pleasure in reading his "Biographic Clinics" of DeQuincy, Carlyle, Darwin, Huxley and Browning.

Toward the close of my series of cases I made definite notes regarding headaches. That is, at the time the glasses were ordered the patient was questioned as to whether he had had headaches and if so for how long and how often. When he returned in two weeks or later, having secured and worn the glasses in the meantime, additional notes were made.

These notes resulted in the following:

Total number reporting back in regard to headaches, 50; headaches made worse after wearing glasses, 6 percent, or 3 patients; headaches uninfluenced by glasses, 6 percent or 3 patients; headaches relieved partially or completely after wearing glasses, 88 percent, or 44 patients.

This does not include those who had errors of refraction and suffered from headaches, but did not report back after wearing the glasses.

Epilepsy has long been considered as probably due to a constantly acting slight irritation. Gould found in examining 68 epileptics that 98 percent of them had astigmatism.<sup>5</sup> Some epileptic patients have definitely ceased having convulsions after the correction of an error of refraction.

Insomnia, chorea, and hysteria have all been held up as due in some cases to eyestrain and with apparent justification. In regard to the effect on the digestive system, the nausea and vomiting associated with migraine has been referred to. Any one who doubts that nausea can be caused by the eye has but to place a cylindric lens before a neurotic astigmatic patient and turn the axis the wrong way. Errors of refraction must also bear scrutiny in tracing the etiology of seasickness and carsickness.

Having examined the eye from the general medical point of view it might be well, in closing, to remember that it is not the intention to exalt this organ to a high plane of diagnostic value or etiologic importance above its fellows. It has only been dealt with here exclusively because it was the subject-matter of the paper. It has a diagnostic value and it has an etiologic importance, but it ranks in each above some and below other constituent parts of the body, and it was largely to determine its relative position that a study of it appealed to me as a general practitioner.

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## AN APPARENTLY HEALTHY CHILD BORN TO PARENTS, BOTH OF WHOM WERE IN THE ACTIVE STAGES OF SYPHILIS AT THE TIME CONCEPTION OCCURRED.

BY

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The disastrous results that follow conception when either parent is in the active stage of syphilis are too well known to require comment.

It may not be improper, however, to quote some figures on the subject, taken from the excellent chapter on hereditary syphilis in Taylor's book on "Venereal Diseases."

For example, Kassowitz says, "one-third of all children procreated of syphilitic parents are deadborn, and of those born living, 24 percent die within the first six months of life." Fournier, in private practice, found that "two out of three hereditarily syphilitic children died, either before, at, or soon after birth." "In hospital practice he found that of 167 children born of syphilitic mothers 145 died; which means that one child of seven or eight survived." In order to eliminate error so far as possible, he gathered statistics from medical literature embracing the whole world. He collected 447 cases in children whose fathers or mothers were syphilitic and found that out of this number 343 died and 104 survived—of the 343 deaths only six lived beyond the first year (1:4.3).

Taylor says: "In case of the infection of both parents the disease is likely to be transmitted in an intense form, resulting in the death of the fetus or in the early manifestation of symptoms."

To quote further, Lörvy found that by treating pregnant syphilitic women by inunctions the ratio of abortion was reduced from 29.5 to 13.5 percent. After inunctions there were 75 percent of living children.

In Fonberg's experience, inunctions reduced the percentage of abortions from 28.5 to 14. "He adds, however, that too energetic treatment may be injurious to mother and child."

It is not my purpose to discuss the propriety

of administering treatment to a pregnant syphilitic woman, as this question was definitely settled long ago. In spite of the fears, expressed by a few earlier writers, that mercurial treatment in these cases was injurious to the woman or child, or both, the evidence of so many competent observers points conclusively to the fact that if properly conducted nothing but the most beneficent results follow.

The case I have to report is as follows:

Mrs. X., aged 28, was an efficient and highly prized maid in a very prominent family. A rather disfiguring lesion appeared upon her upper lip, for which she consulted the family physician. As the condition did not improve, she was sent on April 29, 1904, to Dr. J. William White, who found a chronic, elevated cartilaginous sore on the upper lip, with enlarged submental, submaxillary and cervical lymphatics and a few faint reseolous spots on the abdomen. The sore appeared between five and six weeks previously.

The situation was complicated on account of the fact that the woman had been married but nine weeks, and it was not known from whom the infection had come. Appreciating the imperative necessity of removing the patient at once from the family, where she was employed as a child's maid, Dr. White placed her in his ward in the hospital, where I had the opportunity of seeing her daily. It was thought desirable to convey no hint to the patient as to the nature of her trouble, as we were able to control the treatment perfectly without so doing.

The lesion occupied the right half of the upper lip. It was oval, approximately the size of a silver half-dollar piece, markedly elevated, and having a very firm, hard base. There was no true ulceration, and hence no discharge, but the epithelium of the central portion was exfoliated. The entire surface was of a deep red color. There was but little discomfort.

A diluted blue ointment was applied to the lip and the patient was subjected to inunctions of one dram of blue ointment daily, for ten days. The constitutional treatment was continued by the internal administration of from 0.06 to 0.1 gm. (1 gr. to 1½ gr.) of mercury protiodid daily according to the toleration of the patient. The usual attention was given to the care of the teeth and mouth, and to diet. The patient left the hospital on June 24.

Subsequently she was given pills of the mercury protiodid 0.02 gm. (¼ gr.) each. It was found that she could take but three of these

daily. Four were taken for brief periods occasionally, but it was invariably found to be necessary to drop back to three on account of a beginning pytalism. The three pills daily were well borne throughout; they did not derange the alimentary tract in any way.

Under the treatment, the eruption rapidly faded and the glands decreased in size, but the chancre retrograded with great slowness. Even now, after two years, while there is no suspicion of scarring, the pigment has not entirely disappeared, the site of the lesion being quite plainly visible.

In November, 1904, the patient told me she was pregnant. Appreciating the necessity for very active treatment, the matter was reviewed, but I did not feel able to institute any change, as it was impossible to administer more mercury by mouth, and inunctions could not be given. As there had been no untoward symptoms (falling of hair, mucous patches, etc.), I decided to continue the same treatment. There was no incident to note throughout, except on two occasions some pain was felt in the tibias, which disappeared after a short course of iodids.

On May 1, 1905, the patient fell in labor, and was delivered of a perfectly healthy male child, weighing about eight pounds. I have seen the child frequently during the past year, and it has never shown the slightest evidence of anything but the most perfect health. There has never been a suspicion of snuffles or other specific manifestations. It is fed from the mother's breast, sleeps well, and has thrived as well as any child could.

Taylor says: "In the majority of cases of hereditary syphilis, symptoms appear about the third week. The danger of the death of an infected child diminishes as it grows older, and freedom from symptoms until after the sixth month justifies a favorable prognosis." As this child has completed its thirteenth month without mishap, the likelihood of specific manifestations may be considered very remote.

On January 8, 1906, I saw, for the first time, the husband of the woman alluded to in the preceding notes. He is 30 years of age, was born in Ireland, came to this country about the beginning of the year 1903, and is employed by the Adams Express Company.

The only fact that seemed to me to have any bearing upon his case that I could elicit by judicious inquiry was the statement that a little over two years before he "had a sore on the left side of the lower lip, inside and out." He con-

sulted a doctor, who said the sore was due to eating bad meat. It was thoroughly cauterized, after which it healed without further treatment. No history of secondary manifestations could be obtained. He took a little medicine at the time the sore was cauterized for a very brief period, but none after.

He presented, on the date mentioned, an extremely swollen left hand. At about the middle of the dorsum there was an irregular crater-like opening, with necrotic edges and subjacent tissues. He stated that in January, 1905, he felt pains in the left shoulder and arm, which he thought was rheumatism. This seems to have no connection with his present trouble. Some time in February the left hand was squeezed between two heavy boxes. The accident caused very little pain, and no attention was paid to the incident. In May, 1905, a painless swelling appeared on the back of the hand, which became gradually larger. Finally he applied to a hospital for treatment, where the lump was incised in November. Nothing but blood was obtained. A second incision was made some time subsequently, and medicine given internally, but with no benefit.

The lesion presented the typical appearances of an ulcerating gumma. Mixed treatment was therefore administered internally. Under the influence of 0.65 gm. (10 gr.) of potassium iodid, and 4 mg. ( $\frac{1}{16}$  gr.) of mercury bichlorid, three times a day, the lesion rapidly assumed a healthy appearance, the swelling subsided, and prompt healing followed. When the swelling of the hand had entirely disappeared, it was noted that the knuckle, or normal prominence of the distal end of the middle metacarpal bone was absent, and the corresponding finger was shorter than its fellow of the opposite side. A röntgen-ray picture shows that the proximal end of the shaft of this bone has been the seat of a destructive process, and that some three-fourth inch of the entire thickness is gone, allowing the distal part of the shaft to approximate the wrist-joint.

The points of interest in this case are:

1. Both parents were syphilitic at the time the mother became pregnant. Conception took place about July 24, 1904. At this time, the mother was somewhere between the fourth and fifth months of the disease, and had been under treatment but three months. It is impossible to fix with any certainty the exact period reached by the father at this date, as he is uncertain as to dates, but it is probably safe to say it was

between the sixth and the twelfth month. He had had no effective treatment.

2. The disease appears to have been acquired innocently in each case.

3. It seems reasonable to assume that without treatment the mother would have aborted, or, the child, if carried to full term, would have exhibited unmistakable signs of inherited syphilis. It is interesting to note, therefore, that 0.05 gm. ( $\frac{3}{4}$  gr.) of mercury protiodid daily, taken by the mother during the entire period of gestation, not only controlled her own disease, but resulted in the birth of a healthy child.

4. That the father was syphilitic was demonstrated by the unmistakable gumma; and while this appeared unusually early, according to the history, this discrepancy may be explained, first, by the fact that he had not received any treatment; and second, upon the well-recognized observation that the contusion of the hand acted as a predisposing cause.

5. The child not only has been free from any of the signs of hereditary syphilis, but has, at all times, been plump, well nourished and thriving, and seems normal in all respects. As an evidence of good health, the mother says they have not lost a night's rest on account of the child, and this without a single dose of medicine.

## CLINICAL NOTES.

### BILATERAL CERVICAL RIB WITH SYMPTOMS OF PRESSURE ON THE BRACHIAL

#### PLEXUS.\*

BY

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Until the introduction of the röntgen rays, cervical rib was rarely diagnosed during life, and if it were, only when pronounced symptoms were present. Eisendrath,<sup>1</sup> a little over a year ago, was able to collect only 34 cases in which "cervical rib was diagnosed or described

during life." Riesman,<sup>2</sup> whose exhaustive article, written about the same time, contains an extensive bibliography, refers to 46 cases "with symptoms." During the last year numerous cases with symptoms have been reported. I have found references to about a dozen additional cases of cervical rib. Some of these had no symptoms, some I was unable to consult. Six at least might be added to Riesman's list. Babcock's<sup>3</sup> case with "resulting gangrene of the fingers" will be remembered by many. Other cases are those of Beck;<sup>4</sup> Ascher<sup>5</sup> two cases; Knoch,<sup>6</sup> and Wimpler,<sup>7</sup> (title only, Neuritis of the Brachial Plexus as a Result of the Presence of a Cervical Rib). Four of these cases showed symptoms of pressure on the nerve or its roots, two of pressure on the artery.

If we were to collect all the cases in which this anomaly has been recognized *intra vitam*, irrespective of symptoms, the list might be greatly extended. Dr. Pancoast tells me that he now sees at least a half dozen cases a year and I suppose other röntgen-ray workers have a similar experience. In many cases, the discovery of the condition is accidental, on the other hand, the ease with which a diagnosis, otherwise doubtful, may be confirmed has stimulated physicians to a more careful search for the symptoms and signs of cervical rib. As a result fewer cases are overlooked than formerly.

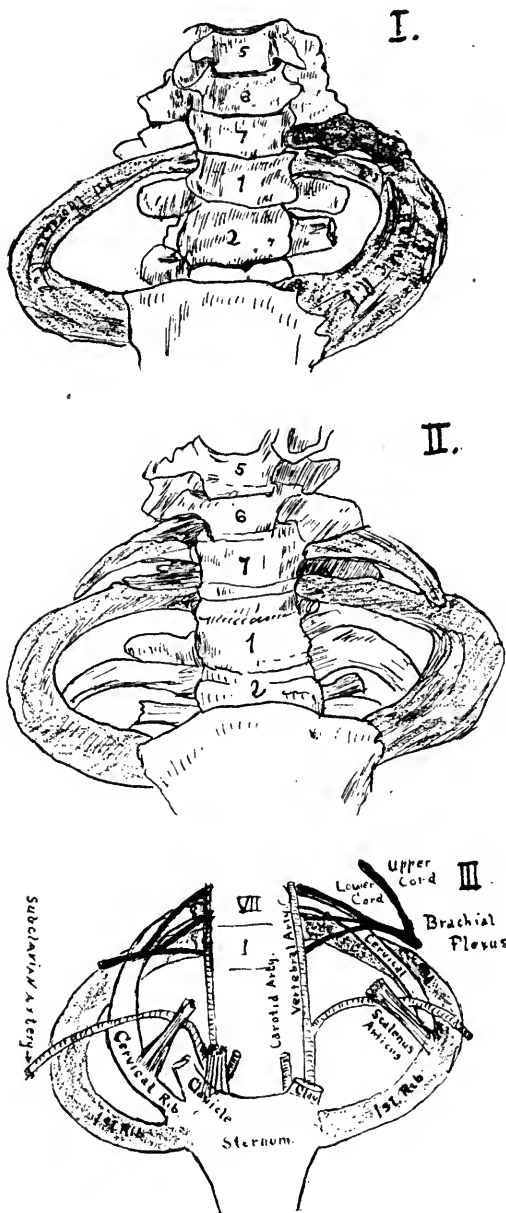
The classification of Turner,<sup>8</sup> based on his own researches and those of Gruber, is the one generally followed by English writers. Turner states that "cervical ribs may be either the unusually developed rudiments of the anterior transverse process, or rib, of the seventh vertebra; or merely unusually developed epiphyses."

"When a rudimentary rib is a developed anterior transverse process, it may present one or other of *four degrees* of development: (a) When it is very short and possesses only a head, neck and tubercle; (b) when it extends beyond the transverse process, possesses a body, and ends either free, or joins the first thoracic rib; (c) when it reaches beyond the transverse process and is connected either by ligament or the anterior end of its body with the first costal cartilage; (d) when it resembles a true rib,

\* Case presented at the Philadelphia Neurological Society, December 19, 1905.

possesses a costal cartilage which joins, with the cartilage of the first thoracic rib, the manubrium sterni."

The first two figures, roughly traced after Shepherd,<sup>9</sup> exemplify Turner's second degree.



In one, the accessory rib is attached to the first rib by a more or less perfect joint; in the other dissection, two floating cervical ribs are seen. The third figure, which is a diagrammatic sketch from an elaborate drawing of one of

Turner's cases, shows a rib of the second and another of the fourth degree, *i. e.*, possessing all the characters of a true rib. This diagram also illustrates the usual and important relations of cervical ribs. It will be noted that the lower cord of the brachial plexus passes over the cervical rib. The seventh and eighth cervical nerves pass respectively above and below the rib, the first dorsal below the first rib. Pressure may be on these nerves or on the whole cord. There may be pressure on the sympathetic ganglion or nerves which are in relation with the neck of the rib. Pain, paresthesia, anesthesia, hyperesthesia, weakness, paralysis and atrophy (muscular) are among the symptoms which may result. The scalenus anticus, as is very well shown, is usually attached, in whole or in part, to the accessory rib, provided the rib is long enough. The subclavian bears its normal relation to the muscle and therefore crosses over the rib high in the neck. On this account Paget thought it might easily be mistaken for an aneurysm if coincidentally, the arteries had "more than the natural pulsation." Although this mistake has been made in one case, in others, aneurysm has actually existed due to pressure or thrombosis are, small or absent pulse, pallor, cyanosis, coldness, edema, etc. Gangrene has been attributed by some to trophic, by others to circulatory disturbances.

The röntgen-ray print here shown is from a case of my own and shows bilateral cervical ribs, the one on the right being longer, the one on the left more prominent. The latter alone gave symptoms and was the only one diagnosed. These ribs belong at least to Turner's second degree. The one on the right looks as if it might join the first rib or even the sternum. An exposure taken with the chest next to the plate would probably solve this question. Unfortunately I have not been able to arrange for another exposure. I am indebted to Dr. Pancoast for taking this plate.

The following is a brief report of this case:

The patient was Mrs. L. McS., aged 31, occupation, house-wife. Her first husband died of pulmonary tuberculosis, her mother of cancer of the uterus and her father of apoplexy. One brother died of tuberculosis and another of "brain fever." She has one child living. Two are dead.

The patient has had diphtheria and typhoid, the latter at 19. She suffered with indigestion

as a small child. At about 18 or 19 she was very anemic, probably chlorotic.

When she presented herself at the University Dispensary about September 1, she complained of diarrhea of 18 months' duration following confinement. Objectively she showed extreme pallor with a decided yellow tinge, and edema of the feet. On physical examination there was slight diminution of resonance at the right apex, increased vocal and tactile fremitus, doubtful bronchovesicular breathing and fine rales. The heart area was normal. There were functional murmurs over the heart and a systolic bruit in the vessels of the neck. The right kidney was palpable. Temperature 99.4°, pulse 84. The urine and sputum were negative. Blood: Hemoglobin 35 percent, red blood cells 3,835,000

nation it was found to be of a bony consistence and appeared to pass backward toward the spine. Pressure on the tumor caused severe pains down the inner side of the arm. The patient then volunteered the statement that she had suffered from such pains, as well as from numbness and tingling for many years. Dr. Pancoast kindly took the skiagraph which I have shown and confirmed the diagnosis, and also discovered the corresponding rib on the other side which had not been diagnosed.

Subsequently, I had the opportunity of examining the patient again. (December 19.) She told me that she had had numbness in the arms since she was 18 years of age. Recently the symptoms have been more pronounced though never severe. The right arm is affected but



white blood cells 137,000. Microscopic examination showed pallor of the red blood cells and absence of changes in size, shape, and staining reactions. No normoblasts. Differential count negative. Weight 117 pounds.

She was treated by milk and egg diet, bismuth, strychnin, iron, etc. Her diarrhea promptly stopped and in about six weeks she gained 16 pounds. The red blood cells increased to 4,600,000 but there was relatively little gain in the hemoglobin. The signs at the right apex have remained about the same except that the rales have disappeared.

About a month ago while examining the apices of the lungs, Dr. Sailer, who happened to be present, called my attention to a slight prominence above the left clavicle. On exami-

not so markedly as the left. The symptoms complained of are numbness, tingling and severe aching. The aching pain is felt in the chest and back and seems to pass down the arms and especially the left arm. On the right the tingling is limited to the ulnar side of arm and to the last two fingers. On the left the paresthesia is general, and is sometimes accompanied by hyperesthesia. The arms and hands are never cold, cyanosed, nor swollen. Rubbing frequently relieves the symptoms. The patient never has any neuralgic pain in the arms. She frequently has cramps in the lower limbs and supposed the pain in the arms was of similar origin.

More careful physical examination at this time confirmed (if the expression is permissible)

the presence of the additional rib on both sides. On the left, the rib could be traced from its junction (?) with the sternum nearly to the spine. The subclavian artery could be seen pulsating high in the neck and was of course easily felt. Posterior to the artery the cord of the brachial plexus could be rolled under the finger. Pressure on this cord caused a characteristic pain down the arm. On the right the rib could be felt but only with difficulty. The high position of the subclavian artery seemed to me to be a suggestive sign. As noted the percussion note at the right apex was of a decidedly higher pitch than the left. This I am satisfied was due to the position of the rib in close relation to the clavicle and first rib. On the left, the rib was well above the clavicle and did not affect the percussion note. Though tuberculosis cannot be absolutely ruled out in this case, the results of percussion must be considered negative. In the articles I have read, I have thus far seen no reference to this point.

The grip on both sides was very good and the patient had lost none of her power to perform the more delicate movements. There was no atrophy of the muscles of the hand or forearm. Sensation was quite normal at the time I tested her, though at times she has hyperesthesia. Both pulses are equal and both appeared to be of normal volume. On the whole we must conclude that the symptoms are due to slight pressure on the plexus, so slight as to have caused no decided organic changes. There may also be slight interference with the circulation.

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**Rabies in England.**—The fact that no death from hydrophobia has been recorded in England since 1902 is cited as an excellent illustration of the preventive treatment of disease.

**The Society of German Neurologists** will hold its first annual meeting at Dresden in September. The principal subject of discussion will be the surgical treatment of nerve disorders.

## POSTOPERATIVE INTRAOCULAR HEMORRHAGE RESULTING IN TOTAL BLINDNESS AND DESTRUCTION OF THE EYEBALL.\*

BY

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of Philadelphia.

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Spalding, in reviewing 50 cases of intraocular hemorrhage, says that "cases of choroidal hemorrhage after extraction of cataract with or without iridectomy are generally supposed to be very rare and for that reason every occurrence of this serious accident ought to be reported, in the hope that by comparison of the condition of the eye before the extraction we may discover some means of prevention in the future." The justice of this remark is obvious when we consider the gravity of the situation resulting from such serious accident as intraocular hemorrhage during or after cataract operation, an accident that always culminates in total blindness, and very often necessitates the enucleation of the eyeball. Spalding, in 1896, collected 50 cases from the literature and since then 25 more cases have been reported of total destruction of the eyeball as a result of this apparently unavoidable accident, and I deem it my duty to add another case to the records of this very important subject, a case that caused me a few sleepless nights although I was sure that the accident was not attributable to any faulty technic of mine. Further, a careful gleaning of the literature showed me that many of the great ophthalmic surgeons had been unfortunate in meeting such grave accident; not that I wish to be among the great but that I do not intend to be among those who, because of an extreme sensitiveness, would hide such fact which might lead to the discovery—by a process of analysis of a sufficient number of cases—of the real cause of the accident and thus learn how to prevent the same. The accident is rare so that no man, however extensive his clinical experience, can obtain sufficient clinical data on the subject,

\*Read before the Eastern Medical Society.

and he is compelled to learn by the experience of others, and every case on record is, therefore, of great service to the ophthalmic surgeon seeking information.

**CASE I.**—Mrs. B. B., an ill-nourished and weak woman, consulted me at the Southern Eye Clinic July 26, 1906, on account of blindness. She has not been in good health for the last 20 years, suffering from pain in the joints, headache, and gastric disturbances. Her left eye has been totally blind for the last 40 years as a result of some inflammatory condition. Present history, right eye began to fail about a year ago and at present she cannot see to go about.

On examination I found the following condition: O. D. linear corneal opacity 4 mm. in length situated horizontally below the pupil, eye quiet; pupil dilated, does not react to ordinary light but reacts to concentrated light; anterior chamber well preserved; cornea hazy; tension plus 2, slight greenish lenticular reflex. O. S. large corneal leukoma; pupil oval, apex downward does not react to light; a yellowish degenerative mass fills the pupillary space entirely occluding the pupil; anterior chamber obliterated and iris is adherent.

Ophthalmoscopic examination revealed an entire opaque lens in the right eye, no view of fundus light, projection good.

Diagnosis, hypermature cataract, extraction advised. The following was given as preliminary treatment: Tincture nux vomica, 10 drops; compound tincture cinchona, 20 drops; spirit glonoin, 2 drops; essence of pepsin sufficient to make one teaspoonful, three times daily. This I gave to tone up her general condition, and a weak solution of eserine to be instilled into the eye twice daily.

August 9, at 2 p.m., the patient having been prepared for operation, I made the corneal incision with the Graefe knife. Immediately at the completion of the corneal section, the lens was forced out by the intraocular pressure, some vitreous escaped, and the anterior chamber collapsed. The vitreous was somewhat liquefied. I made no attempt to do an iridectomy but removed the speculum and bandaged the eye. The patient complained of a little pain in the supraorbital region which I attributed to the pressure of the speculum. However, the patient was restless and at 10 p.m. I was summoned to see her on account of severe pain. When I was able to reach my patient several hours later, I found the bandage soaked with blood which was already somewhat dry. I was informed that she was very restless, nause-

ated, and vomited several times. Of course, the clinical picture was sufficient evidence of the real nature of the accident. I removed the dressing and found the eyeball filled with blood; the edges of the wound, however, were not separated. I made no effort to interfere with the internal condition, but flushed the conjunctiva and reapplied the bandage and administered a hypodermic injection of morphine. She was relieved somewhat from pain and slept a few hours. The next morning the bandage was clean but eye still painful. I removed the bandage and found no blood in the conjunctival sac and a small portion of the iris was clearly seen above. Two hours later she attempted to go down stairs and was seized with vomiting and acute pain. Reaching the patient soon after, I found the dressing full of blood, the wound gaping, and dark clots of blood separating the edges. At the request of the family the patient was sent to the hospital where she developed panophthalmitis. After a week's time, at her request she was sent to another hospital. I did not see the patient for two months. In the early part of October, I again saw the patient, the globe was shrunken, but free from inflammation and pain. She did not vomit. Her family physician, Dr. Cartman, told me that he suspected cancer of the stomach.

At first I was under the impression that the hemorrhage was caused by the vomiting, but I was soon convinced that vomiting is one of the symptoms that enter into the general make-up of the classic picture of the accident rather than the cause thereof. Today, January 1, 1907, the patient is free from pain, does not vomit, is totally blind, with a shrunken eyeball, and has apparently no cancer of the stomach.

The clinical picture presented in postoperative intraocular, or, as it is more properly called, retrochoroidal hemorrhage is classic and characteristic. Sudden onset of severe pain in the eyeball, as if the eye were ready to burst, accompanied by nausea and vomiting, followed soon by the appearance of blood soaking through the bandage are the pathognomonic symptoms. A sudden attack of nausea, vomiting, and severe pain in the eye are indeed sufficient evidence of the occurrence of the accident; the appearance of the blood simply completes the clinical picture. This accident is not attributable to any carelessness or faulty technic on the part of the operator, but rather to a hemorrhagic diathesis of the patient.

Some of the best ophthalmic surgeons have on their records cases of intraocular hemorrhage following either the extraction of cataract or an iridectomy for the relief of glaucoma. This apparently unavoidable hemorrhage has occurred in cases that were considered favorable from the operative standpoint. There is no limit to the time of its occurrence.

In the 75 cases which I was able to find in literature, it occurred mostly within one hour after the operation; some occurred as soon as the corneal incision was completed, even before the removal of the cataract; some occurred 24 hours after the operation; while one occurred three days after the operation. Some of the patients were considered out of danger prior to the occurrence of the hemorrhage. All cases of choroidal hemorrhage reported followed cataract extractions simple, combined, or in cases with a preliminary iridectomy; only in two cases did the hemorrhage follow iridectomy for the relief of glaucoma, a fact that speaks against the theory that the hemorrhage is caused by a sudden reduction of a high intraocular pressure.

Intraocular hemorrhage following cataract operation is rare. Some ophthalmic surgeons with extensive clinical experience only have had one case, others none. Some, however, were fortunate and brave enough to report six and eight cases.

Sattler, an eminent ophthalmologist, observed six cases out of 1,869 extractions within a period of 10 years, 0.321 percent. Prior to that time, he observed 1,250 cases of cataract operations in which not a single case of hemorrhage occurred. At the Augenheimanstalt, in the city of Basle, in 630 extractions, from 1885 to 1895, three cases of retrochoroidal hemorrhage were observed. Pflüger observed eight cases. Among the eminent American ophthalmic surgeons who met this accident are the names of de Schweinitz, Jackson, Risley, and Knapp.

As a matter of interest it is worthy of notice that most of the cases were observed in one eye only, in four cases only the accident occurred in both eyes, and it occurred in noncomplicated as well as in complicated cases. The ultimate result in all the cases was shrinking of the globe

with total loss of vision. In some cases panophthalmitis developed, in a few enucleation had to be done to relieve pain. In no case did sympathetic irritation develop. As to the possible causal factor, the literature on the subject is so meager that one is not justified in drawing any conclusion. Nausea and vomiting were considered by many to be the principal cause of the hemorrhage, but, at present, these are considered as symptoms rather than the cause. Sudden reduction of a high intraocular pressure was held responsible by many for the accident; still others maintained that an atheromatous condition of the bloodvessels is the prime factor in the causation of the hemorrhage.

A study of the cases reported has convinced me that no single factor can be named as sufficient to explain the causal relation, but that there is a combination of causes that account for the hemorrhage, such as a high intraocular pressure, partial degenerative changes in the vitreous, and an atheromatous condition of the bloodvessels. The psychic influence has not received sufficient attention and yet I feel positive that there is an element of shock in these cases acting as the exciting cause, which, when the predisposing factors are present, will give rise to an intraocular hemorrhage. The cause not being known with any amount of accuracy and there being no premonitory symptoms, it is very hard to determine upon any prophylactic measure that will possibly prevent the accident. It appears to be an unavoidable hemorrhage and no measure whatever, from a preventive point of view, will be available, yet in all cases of hypermature cataract with high tension, and in delicate and ill-nourished nervous patients, one should think of the possible occurrence of the accident and have recourse to some measures to prevent it.

Various measures have been offered to prevent the accident, such as operating in the sitting posture, the injection of ergotin hypodermically, and also compression of the carotid artery. It seems to me, however, that the most rational procedure in these cases would be the hypodermic injection of morphin immediately before the operation and that it should be used when-

ever an intraocular hemorrhage is anticipated. While it is of very little value after the hemorrhage has occurred, I feel sure that it has a prophylactic value in preventing it by allaying the excitement and reducing the shock to a minimum. The patient falls asleep after the operation for several hours and a hemorrhage may thus be avoided.

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### A CASE OF ADIPOSIS DOLOROSA.\*

BY

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of Philadelphia.

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The following case of adiposis dolorosa is from the service of Dr. F. X. Dercum at the Jefferson Hospital, to whom I am indebted for the privilege of placing it upon record.

K. A., female, white, widow, aged 54, came to the neurological dispensary May 16, 1906, complaining of pain in the flesh about her knees, so severe as to make walking very difficult. This pain was rarely spontaneous, but induced by motion, palpation, or by contact of her flesh with the bed or chair. She complained also of a burning sensation in the palms of her hands, the soles of her feet, on top of her head and over the sacral spine. At times she would have a feeling of numbness about the jaws and knees or a tingling or crawling sensation about the trunk and arms. Headache, over the temples, was more or less constant. Her flesh would bruise easily, apparently without adequate cause, and she manifested extreme fatigue upon slight exertion. She was nervous, irritable and anxious, with distinct failure of memory. In addition to the pain in the adipose tissue about her knees, she complained of pain within the joints. Her weight was 225 pounds.

The symptoms were first noticed by the patient about one year before she came to the dispensary, and had been steadily increasing in severity. She had been treated during this time for rheumatism.

The previous history was as follows: Married at 25 years of age, but had never been pregnant; catarrhal jaundice when 37 years; syphilis (contracted from her husband), at 39 years; peritonitis, rheumatism and sciatica (left). No history of alcoholism.

The family history was negative except that her father died of pulmonary tuberculosis. It is of interest to note that her mother's people were all inclined to be fleshy. Upon examination of the patient, masses of adipose tissue, exquisitely painful when palpated, were found distributed about the knees, elbows, and back of the arms.

These masses were nodular and apparently lobulated. The face, hands and feet were not affected, and the trunk but slightly. The thyroid gland was not palpable. There was no atrophy of the small muscles of the hands, but marked deformity of the little fingers of each hand, characterized by overextension first phalanx, flexion of second phalanx and extension of third phalanx. The ring fingers presented the same deformity in a slighter degree. Several of the fingers had nodular deposits about the first joint. Upon both legs were large varicose veins. Reflexes were diminished. The skin was dry, to an extent that had attracted the patient's attention and there was some dulness of hearing due to a slight eustachian catarrh (Dr. Klopp). The eyes were normal except for hyperemia of the discs (Dr. Veasey). The pain within the knee-joints was due to a dry arthritis, probably rheumatic (Dr. Stewart). A few granular casts were present in the urine, but no albumin or sugar; the specific gravity and reaction were normal.



The patient was given thyroid extract in ascending doses, which afforded her marked relief from the pain, but gave rise to gastrointestinal symptoms whenever pushed beyond

\*Case presented before the Philadelphia Neurological Society, Oct. 23, 1906.

a moderate dose. Aspirin was also of distinct value at times in relieving the pain. Potassium iodid produced symptoms of iodism when given in moderate dose.

At the present time (five and one-half months later), the patient states that she is not nearly so restless, is sleeping better, is much stronger, and that her pain is less. From personal observation I would say that the nodular masses of adipose

tissue are smaller and that handling them causes the patient much less pain than formally.

This improvement I believe to be due to the thyroid treatment, as she improved while taking it and became worse whenever it was discontinued.

In the history of this patient I would call attention to the antecedent syphilis, which disease, like alcoholism, has so

frequently formed a background for adiposis dolorosa. The apparent absence, or at least marked diminution in size of the thyroid gland, is also of interest.

Sciatica and other forms of neuritic affection, as herpes zoster, have frequently been observed in association with this disease, and Dercum's conclusion in his original paper as to the neuritic nature of adiposis dolorosa<sup>1</sup> has long since been verified by pathologic findings (interstitial neuritis).

According to Vitant's classification<sup>2</sup> of adiposis dolorosa into nodular, localized diffused and generalized diffused, this patient would belong to the first or nodular group.

Of the five cardinal symptoms emphasized by Vitant and Dercum, this case presents four—fatty deposit, pain, psychic phenomena and grave asthenia, the absent symptom being anesthesia, which would seem to be replaced in this instance by marked and widely diffused paresthesia. Anesthesia, however, is not a constant symptom in this disease, cases without

sensory loss having been reported by Dercum and McCarthy<sup>3</sup> and others.

Digital deformity was present in one of the three cases originally reported by Dercum, but is a symptom of comparative rarity.

Roberts<sup>4</sup> has placed on record a case showing a high degree of improvement following the administration of thyroid extract and potassium iodid.

In considering the pathogenesis of adiposis dolorosa it would appear that alcoholism or syphilis may, in some instances, act as predisposing factors, probably through favoring the formation of degenerative changes in the thyroid gland or pituitary body. In this connection it is interesting to note that in May, 1905, Dr. E. W. Taylor reported a case before the Boston Society of Psychiatry and Neurology in which the patient developed adiposis dolorosa while convalescing from acute alcoholic neuritis.

While at the present time we have no positive knowledge as to the direct cause of adiposis dolorosa, the frequency with which lesions of the thyroid gland and pituitary body have been found would draw our attention to these structures.

It is well known that there is some interrelation between their functions, and the fact that patients have shown marked improvement upon the administration of thyroid extract is a therapeutic signboard pointing toward the same probable etiology.

A case in which extreme obesity had followed a wound of the pituitary body has been reported by Madelung.<sup>5</sup>

Dr. Dercum states that he has never seen a case of complete recovery in adiposis dolorosa, yet much can be done toward affording some measure of relief, and distinct remissions have been known to occur.

In closing I wish to emphasize the value of an early diagnosis in adiposis dolorosa. Many cases are unrecognized for a long time, the most common mistake being to make a diagnosis of rheumatism, as was done in the case I have reported.

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<sup>3</sup>Dercum & McCarthy: *Amer. Jour. of Med. Sc.*,  
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## SPECIAL ARTICLES.

### SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.

Proceedings Reported by the Secretary,

WILLIAM J. GIES, PH.D.,

of New York.

The twentieth meeting of the Society for Experimental Biology and Medicine was held in the Rockefeller Institute for Medical Research, on Wednesday evening, February 20. The president, Simon Flexner, was in the chair.

*Members Present.*—Adler, Burton-Opitz, Calkins, Carrel, Conklin, Emerson, Ewing, Field, Flexner, Foster, Gibson, Gies, Lee, Levene, Levin, Mandel (J. A.), Meltzer, Meyer, Murlin, Noguchi, Opie, Salant, Wolf, Yatsu.

*Member Elected.*—C. Ward Crampton.

#### ABSTRACTS OF ORIGINAL COMMUNICATIONS.<sup>1</sup>

*Experimental Studies on Nuclear and Cell Division.*—E. G. CONKLIN.

Extensive experiments were made on the segmenting eggs of *Crepidula plana*. These experiments included a study of the influence on nuclear and cell division of hypertonic and hypotonic sea water, of ether, alcohol, etc., of the lack of oxygen, of the electric current, and of pressure and shaking. Many important conclusions were reported and numerous drawings shown.

*Heterotransplantation of Bloodvessels.*—ALEXIS CARREL.

The author's method consisted of removing a segment of the abdominal aorta of a cat, and of reestablishing the circulation in the lower part of the aorta by interposing a segment of the jugular or carotid of a dog and suturing it to the cut ends of the aorta. It was found that a segment of a dog carotid which had been transplanted in a cat could act as artery for 78 days at least.

*Transplantation of the Kidney with Implan-*

*tation of the Renal Vessels in the Aorta and Vena Cava.*—ALEXIS CARREL.

The transplantation of the kidney with implantation of the renal vessels in the aorta and vena cava consists of extirpating from an animal a kidney with its vessels, together with a patch of the aorta and vena cava; also of transplanting the kidney into the abdomen of another animal and suturing the edges of the patches to the edges of suitable openings made in the walls of the aorta and vena cava. The author used this method mainly on cats and obtained excellent results from the standpoint of restoration of the circulation. Of seven animals operated on, six remained in good health. The seventh died of intestinal intussusception four days after the operation.

*Secondary Peristalsis of the Esophagus—a Demonstration on a Dog with a Permanent Esophageal Fistula.*—S. J. MELTZER.

Injections of indifferent solutions or of air directly into the esophagus cause there a regular peristaltic movement. This latter form of peristaltic movements, which for the sake of brevity the author terms *secondary peristalsis* differs essentially from *primary peristalsis*, that which follows deglutition, through the nervous mechanism by which it is controlled. The secondary peristalsis requires the presence of some sort of a bolus within the esophagus, and presupposes the integrity of the latter; whereas the primary peristalsis requires neither a bolus nor the integrity of the esophagus; even if a large section of the latter is removed, the peristalsis appears in the lower segment in due time after each deglutition as long as the vagus nerves remain intact.

The author demonstrated both forms of peristalsis in a dog with a permanent fistula in the upper half of the cervical esophagus.

*Peristaltic Movements of the Rabbit's Cecum and their Inhibition, with Demonstration.*—S. J. MELTZER and JOHN AUER.

When a well-fed rabbit is fastened on its back on a holder and the hair of the abdomen is removed, as a rule movements of the cecum can be seen sooner or later. The movements are well marked and characteristic in their appearance, and leave no doubt as to the organ in which they take place. As a rule, especially in well-fed rabbits, the movements begin in the colon and travel toward the small gut, that is, they are antiperistaltic in character. But frequently at the end of an antiperistalsis, after only a short interval, the wave returns and runs from the small gut toward the colon; in other words, the antiperistalsis is often followed by a

<sup>1</sup>The abstracts presented in this account of the proceedings have been greatly condensed from abstracts prepared by the authors themselves. The latter abstracts of the communications may be found in Number 3 of Volume IV of the Society's proceedings.

peristaltic wave. The constriction is preceded by a bulging which is more marked than the former. The degree of the constriction (and bulging) is variable. Weaker waves sometimes do not finish the course. A complete course of a wave in one direction lasts from 30 to 50 seconds. The average rate of the movements is about one per minute, but the rhythm is far from being regular. Various influences suppress cecal peristalsis. Ether applied through the nose stops the movements but they return in about a minute after the ether is removed. Pain, struggle and fright stop the movements; but they soon return again. The most striking effect, however, is the one caused by opening the abdomen; the peristaltic movements as a rule disappear completely and permanently.

The authors found that stimulation of the cecum by exposing it to abnormal conditions is capable of inhibiting its movements directly. Laparotomy abolishes the movements of the cecum by direct inhibition, assisted probably also by reflex inhibition. Cecal peristalsis ceased after cutting both vagi. Stimulation of the peripheral end of one vagus caused a tetanic contraction of the entire cecum, especially after destruction of the cord. Some of the above mentioned facts were demonstrated on an animal with destroyed cord.

*Deglutition Through an Esophagus Partly Deprived of its Muscularis, with Demonstration.*—S. J. MELTZER.

The author demonstrated a dog drinking milk in perfectly normal manner against gravity from a bowl on the floor, although a large section of the path of deglutition was deprived of all muscle fibers. The author stated that he had completely removed the muscularis from the entire cervical esophagus of a number of dogs. On the day after the operation they drank milk and water like normal dogs. In these cases there were no muscle fibres for quite a long distance to do the slow work of pushing the liquids into the thoracic esophagus. They were apparently squirted through the cervical esophagus by a muscular force located anteriorly to the esophagus. That this force is not due to the constrictors of the pharynx was demonstrated by another experiment. In one dog, beside the removal of the esophageal muscularis, the middle and lower constrictors of the pharynx were cut and completely put out of function. This dog, also, drank without any difficulty the day after the operation. The throwing force is apparently exercised by the muscles of the mouth and tongue.

The function of deglutition is provided with

a mechanism for a rapid squirting down of appropriate materials. As to which of the mechanisms comes into play in any specific case depends upon the nature of the material which is swallowed.

*Immunity Against Trypanosomes.*—F. G. NOVY.

Heretofore all experiments on artificial immunity against trypanosomes have been made on animals that have recovered from the effects of the parasite which has been living and multiplying in the bloodvessels of that animal. Now that cultures of some of these organisms, as for example *Tr. Lewisi* of the rat and *Tr. Brucei* of nagana, are possible, it was desirable to ascertain whether or not they could be used to immunize against the virulent organisms.

The authors have shown that cultures of *Tr. Brucei* can be attenuated by exposure for about two days at 34° C. By repeated injections of cultures thus treated, attempts have been made to immunize rats and guineapigs against *Tr. Brucei*, but thus far these have been but partially successful.

In view of the fact that rats invariably recover, some soon, others late, from infection with *Tr. Lewisi*, and the further fact that rich cultures of this organism are readily obtainable, it is evident that this species is well adapted for studies on immunity. Up to the present time it has not been satisfactorily shown that trypanosomes elaborate toxins or that they confer immunity by means of soluble or intracellular products. The latter problem was approached by means of plasmolyzed cultures. To effect solutions of the trypanosomal cells the cultures were taken up in distilled water and dialyzed in collodium sacs. Usually after one or two hours of such dialysis in distilled water the trypanosomes completely disappear and the intracellular matter apparently passes into solution. By means of such cultures it has been shown that rats which receive three or more injections on alternate days, on subsequent inoculation with a minimal infective dose of fresh trypanosomal blood from a rat, do not become infected, whereas controls are positive. With such solutions it is possible to hyperimmunize rats so that 0.5 cc. of the immune rat blood protects against a simultaneous and separate injection of the infective blood.

Protection is seemingly obtained against *Tr. Lewisi* by simultaneous and separate injections of the infective blood and plasmolyzed culture, followed 24 hours later by a second injection of the latter. Repeated injections of too large a quantity of the plasmolyzed culture and at too

short an interval leads to a negative phase, the presence of which is indicated by the unusually early appearance of trypanosomes in the blood after inoculation with the virus.

Inasmuch as it may be said that the plasmolyzed material does not represent a true solution, a series of experiments were made with the filtered (Berkefeld) plasmolyzed liquid. While these experiments go to show that immunity can probably be induced by such filtered soluble products, they are not as decisive as they should be, and for that reason will have to be repeated.

*On Secondary Transplantation of a Sarcoma of the Rat.*—SIMON FLEXNER and J. W. JOBLING.

The results of this series of experiments<sup>1</sup> shows that secondary inoculation succeeds in a high percentage of the rats in which no visible metastases can be seen, and in which visible metastases, in the lungs chiefly, are present. These facts bear upon the view expressed by Sticker, that a primary tumor protects the body from the development of a secondary tumor until the period of metastasis arrives, and upon Ehrlich's negative results in secondary transplantations of a rapidly growing mouse carcinoma. The sarcoma studied by the authors is characterized by its infiltrative growth, but it increases far less rapidly than the most active of Ehrlich's tumors, and reaches, in relation to the size of the rat, no such large size as the latter does in proportion to the size of the mouse.

*On Certain Chemical Complementary Substances.*—HIDEYO NOGUCHI.

A comparative study of complement and extract lysins under the same conditions, with numerous important results.

*Effects of Experimental Injuries of the Pancreas.*—ISAAC LEVIN.

The author's results lead to the conclusion that the injuries of the pancreas that produce the gravest effect on the organism are those which cause the most serious interference with the circulation of that organ. To produce a fatal disease it does not suffice to interfere partly with the free secretion of the pancreatic juice into the intestines as in the first series of experiments, or to injure some of the parenchyma and at the same time allow the juice to secrete into the peritoneal cavity, as in the second series. The interference with the circulation must be such as to produce a lesion of the

whole organ so that not only will the organism be deprived of the normal function of the pancreatic cells, as after extirpation of the organ, but also every cell will become diseased and begin to act abnormally and injuriously to the organism.

*The Pathology of Function: An Experimental Laboratory Course.*—HAVEN EMERSON.

An outline of experimental procedures comprising a laboratory course at Columbia University, some common disorders of function and the physiological methods of detecting them.

*The Influence of Alcohol on the Composition of Urine.*—F. C. HINKEL and WILLIAM SALANT.

The data obtained by the authors are illustrated by the appended summary of results of a long experiment:

Table showing the influence of alcohol (50 cc. of 50 percent or 70 percent daily) on the composition of dog urine. Average daily output in grams.

	Fore period. 6 days.	Alcohol period, 50 % 6 days.	70 % 7 days.	After period. 10 days.
Total nitrogen....	5.5856	4.9066	5.2846	5.259
Total sulphur....	0.3368	0.2553	0.2978	—
Neutral sulphur....	0.0917	0.1035	0.1402	—
Inorganic sulphur....	0.2081	0.1334	0.1442	0.2187
Ethereal sulphur....	0.0371	0.0185	0.0133	0.0067
P <sub>2</sub> O <sub>5</sub> .....	0.8016	0.5526	0.5730	0.6959
Chlorids.....	0.3872	0.3000	0.3210	0.3631

*Spirochæta Microgyrata (Löw) and Mouse Tumors.*—GARY N. CALKINS.

The author described a tumor taken from the right foreleg of a female mouse. A piece of the tumor weighing about one and one-half grams was ground up with normal salt solution (3 cc. normal salt to 1 gram of tumor material) and this was injected under the skin of the neck in 12 white mice. The remainder was fixed in 10 percent formalin and in Zeuker's fluid. One tumor has appeared in the inoculated mice. Dr. Ewing described the tumor from sections as an adenoma with glandular characters of the thyroid. Necrotic areas are few in number and very small; mitotic figures are rare.

Sections of the tumor put through the Levaditi silver nitrate method reveal the presence of *Spirochæta microgyrata*. The spirochæta is not widely distributed but may be found at various points in the tumor mass, especially in a few small vacuolar areas. It has the characters of the species described by Löwenthal in 1905 in a case of human ulcerated carcinoma.

*On the Competency of the Venous Valves and the Venous Flow in Relation to Changes in Intraabdominal Pressure.*—RUSSELL BURTON-OPITZ.

<sup>1</sup>Reference to the previous series was made in Vol. I, p. 554.

In these experiments on dogs, the author measured blood flow in a femoral vein by means of his new recording stromuhr<sup>1</sup> and suddenly raised intraabdominal tension either by pressure with the hands upon the external surface of the abdomen, or by inflation of the cavity with air.

In both cases a retardation of the venous inflow was noticed, the degree of the slowing of the blood stream being in accordance with the increase in the intraabdominal pressure.

A more abrupt and decisive slowing of the blood stream occurred, when pressure was exerted with the hands. It then became possible at times to produce not only a stoppage of the flow, but also a slight backward movement, such as can be accounted for by the stretching of the venous valves.

*On Vasomotor Nerves in the Pulmonary Circuit.*—RUSSELL BURTON-OPITZ.

Various carefully devised experimental procedures failed to reveal vasomotor influences in the pulmonary circuit.

*The Effect of Salicylic Acid upon Autolysis.*—L. B. STOOKEY.

The liver, kidney, spleen and muscle taken from dogs which had received subcutaneously doses of sodium salicylate (0.1 gram, in 1 percent solution, per kilo of body-weight) daily during a period of ten days, showed rates of autolysis greater than those observed in organs taken from normal dogs.

*On the Synthesis of Protein Through the Action of Trypsin.*—ALONZO ENGLEBERT TAYLOR.

The author subjected to tryptolysis 400 grams of protamin sulfate obtained from the spermatozoa of the striped bass. The resultant products, freed from sulfate and concentrated to the point of saturation of the solution containing them, were treated with 300 cc. of a glycerol extract of livers of large soft shelled California clams, which contain a strong, stable, tryptic enzyme. The mixture was treated with toluol and set aside in a sealed flask. This solution, which was clear at the beginning, gradually became opalescent, then cloudy and finally a white precipitate settled out. This mixture was found to contain a large quantity of protamin. The author presented numerous chemical facts in support of this conclusion that protamin was regenerated in this mixture from its nonprotein hydrolytic products.

*A Method for Separating Leucin from Amino-Valerianic Acid.*—P. A. LEVENE.

Separation of leucin from amino-valerianic

acid was accomplished by means of lead acetate and ammonia. A basic lead salt of leucin, insoluble in hot water, was formed. From a mixture containing 52.53 percent of C and 9.39 percent of H, by the use of these reagents, a substance was obtained, which had 54.55 percent of C and 9.90 percent of H. On reprecipitation it acquired the composition: C=54.70 percent; H=10.09 percent. Leucin contains 54.89 percent of C and 10.01 percent of H.

## PHYSICAL DEFECTS AND THEIR CURE IN KINDERGARTEN CHILDREN.

BY

MAUDE M. KELLY,  
of Philadelphia.

It would seem as though everything that could be imagined about education and the Fröbel system about the possible and impossible methods of training the infant mind had been discussed; and yet, every day new books are written, different methods, more modern systems, etc., are being tried. This shows that, as a body, teachers are not satisfied with existing conditions.

I am quite positive, however, that there are a great many facts about children, their care, up-bringing, their moral and mental training, which escape the scientist's eye. This is because they belong altogether to a woman's province and she alone, with her quick sympathy and intuition, can thoroughly understand a young child.

I have had special opportunities to study children of many nationalities and as many different social spheres. The range is from the little Jamaica dorkie, to whom "teacher" represents something almost mysterious because of her seemingly inexhaustible knowledge, to the critical aristocratic, and very much pampered little English or French maiden, who after much coaxing, condescends to learn something from "mademoiselle."

Further, the months spent in the training-school of a large hospital have taught me much; the nights passed in the children's ward, watching from 30 to 40 little sufferers, each bearing his or her pain in a totally different manner, have been my best opportunity in the study of child-nature and the influence of mind over body.

The casual observer usually divides these hospital children into two great classes: First, the patient, brave little tots who seem to bear so much pain without a murmur; and second, the restless, peevish children, who give so much trouble—the medical man calls these last ner-

<sup>1</sup> This volume, p. 179.

vous, hysteric, hyperesthetic, etc.—but it is strange how a very little help will often make them as brave as the others. For example: Is there not generally a great deal of homesickness mixed with the average little girl's cry of pain? A feeling she does not care to put into words, but speak to her gently and see how she will quiet down after you have promised to be near her all night long.

And the so-called little hero, the joy of nurses, the admiration of visitors? It seldom enters anybody's mind to try and find out what it is that really helps him to be so patient, although I suppose a few people have some very pretty and rather vague theories on the subject. But one will find, in most cases, that under the small patient's pillow there is a thrilling book which he has been devouring all day until his little brain can think of nothing but soldiers, Indians and wonderful boys with a marvelous power of endurance. If you have time, tell these stories to the restless little fellow who thinks it impossible to bear the pain of a broken leg patiently, see how he will open his eyes in wonder and soon prove to you that he, too, can be brave. One might multiply the examples, but these are sufficient, and show that it is wrong to treat children with any kind of routine, classifying them in a general way, wholly forgetting individuality.

Let us apply this to the system of education as I find it here. We have seen the effects of mind over body; let us now observe those of body over mind. The general idea of educating a child is to send it to a school, either private or public, for several hours a day to acquire or assimilate a certain number of facts, more or less interesting, the knowledge of which is commonly supposed to create the difference between educated and uneducated people. The teacher's business is to see that these same facts are presented to the young mind in the best manner possible, and as often as necessary until they are properly grasped, not by the individual, but by the class. This is done more or less intelligently, but nearly always conscientiously. At the end of a certain period of weeks or months, the children are given an examination and the majority pass; that is, they remember enough of what they have learned to be able to answer the greater number of questions put to them. But what about the smaller, though always too large percentage who fail? Ah! What could one expect! Here again the children have had a general classification; those who have acquired the requisite number of facts are called bright and industrious, while those who failed to do so

are "dull"—a polite word for stupid and lazy. There is no such thing as a stupid young child—I except, of course, cases of idiocy, etc., which indicate disease or nondevelopment of the brain. Stupidity is a habit, unfortunately too easily acquired, but which may be overcome when the cause has been removed.

Before any knowledge can be acquired three things are required of the pupil: Attention, comprehension, and retention. The first is essential and the other two are consequences of it. This power of attention or application is absolutely impossible with some children, or the effort is of so slight a duration that the impression made on the brain is not sufficient to affect either intelligence or memory.

There are two kinds of dull children familiar to the teacher; the first is the so-called good child who will sit quietly by the hour, evidently listening intently to all explanations, while in reality there is no intellectual comprehension whatever. The mind is a perfect blank! As strange as this may seem, the child is not even thinking, or it is as unconscious of doing so as if asleep. The other type is the wrongly named naughty child; that is, the restless little individual who cannot keep quiet, who is often capable of a slight effort but cannot sustain it, hence the pet phrase by which he is often described, "Would be bright enough, but will not apply himself."

These dull children are a sore trial to the teacher who labors painfully, trying in many ways to teach them something, while the parents blame her, or her methods, for what they call their child's backwardness. All fail to realize that there is some cause for the child's stupidity and unless this is promptly removed the habit of mind will be so formed that it will be impossible to overcome it. These causes are various, but the most common, that which, it is safe to say, is at the bottom of the trouble in a majority of the cases, is some physical deformity.

Greater attention is now being paid to children's eyes and, thanks to the efforts of men who deserve the gratitude of the whole race, we are gradually getting educated to recognize the dreadful misery brought on by astigmatism or eyestrain of some kind, and yet, there are many mothers who still refuse to let their children wear glasses or who only consent to do so when it is almost too late, that is, after the lazy, stupid habit has been acquired. The words, spinal curvature, generally bring forth hysteric shrieks when the teacher, noting the child's extreme restlessness or bad position, dares to mention it to the mother. Yet cases

of curvature taken in time can easily be cured, as Dr. H. Augustus Wilson's statistics for the past year go to prove, and the benefits derived from a careful course in physical culture are patent to all.

Another great cause of trouble is adenoid growths of the nose and throat. The anemic, heavy-eyed, little mouth-breather confronts the teacher day after day, yet she knows how useless it is to suggest that the child's dulness is due to an easily removable cause.

I do not believe mothers wilfully neglect their children, that is, they really do not mean to be unkind to them, but they are so afraid of the care and trouble that their proper up-bringing means that they are constantly trying to shift the responsibility upon someone else. The family doctor is the unfortunate man who has to bear the blame for the nondiscovery of curvatures and adenoids after their presence can no longer be denied; but is this fair?

Many times I have been told when suggesting the necessity of an investigation, "Oh nonsense! Dr. — has known Mary (or Jack) so long, he would have discovered anything wrong." "But did you ever tell Dr. — how backward the child was and what restless, nervous symptoms you had noticed? You call him in occasionally for slight colds, measles, etc., and he sees the child for a few minutes, generally when it is in bed; why should the first symptoms of a slight curvature come under his notice when they have escaped your mother eye?"

As to adenoid growths preventing proper breathing and causing so much mischief, I could mention at least half a dozen cases in which the family physician suspects their presence but is afraid to suggest their removal. Why? Because he will be left to assume the responsibility of the result following operation. Should he try to reason with the parent and discuss the pros and cons of this same operation, he will be stopped with, "Doctor, I leave it all to you!" and again this is not fair. I state facts that have come under my own personal notice. I do not say that all dull, backward children suffer from one or all of the causes mentioned, but the majority do and we should only be too thankful that proper, timely treatment will accomplish so much.

But if one succeed in making parents realize that nothing about the welfare of a child can be put off until later on, and that the anxious conscientious teacher who suggests that the family physician and then the specialist should be consulted about the little boy's or girl's backwardness is not necessarily a crank, then

indeed will good be accomplished. For only with perfect mutual confidence can we work together, striving to be in harmony with the Great Law of the world, "Evolution," remembering that on our united efforts depends the fate of the future generation, its stronger bodies and saner minds.

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## RECENT EDITORIAL OPINIONS.

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**Journal of the American Medical Association.**—**EXPERIMENTAL GASTRIC ULCER:** Gastric ulcers similar to those found in man have been produced in dogs by Turck after the ingestion of large quantities of cultures of colon bacilli, in guineapigs by Rosenau and Anderson following the injection of diphtheria antitoxin and in rabbits by Fütterer by excising small pieces of the mucous membrane and then keeping the animals in a state of chronic anemia. The question arises as to whether the ulcers produced by these various means were alike in their essential features. Turck was able to demonstrate a hyperplasia of acid cells which so far has not been observed in human ulcers. Studies should be carried on with the idea of comparison between human ulcers especially in their early stages and these experimental forms.—**THE RELATION OF THE STREPTOCOCCUS TO SCARLET FEVER:** In a recent paper, Hektoen discusses the protozoan and the streptococcic theories of causation of scarlet fever, neither of which have been generally accepted. There is much evidence which suggests a possible relationship between scarlet fever and some form of streptococcus. On the other hand the absence of streptococci from the infectious skin scales, their relatively poor resistance as compared with the known resistance of scarlet fever virus, and their occasional complete absence in some fatal cases make it seem more likely that the streptococcus is not the cause of scarlet fever but merely a secondary invader. It should be borne in mind, however, that this organism causes most of the fatalities and the patient should be protected from the first against possible infection from other patients harboring streptococci.—**GOVERNMENTAL SUPERVISION OF VACCINE VIRUS:** Much has been accomplished by governmental control of vaccine virus toward preventing infection by extraneous organisms. The virus is now so purified and freed from objectionable qualities that replies from local Health Boards show that the number of sore arms after vaccination has considerably

lessened in the past few years. Such evidence as meeting the argument of the danger of vaccination should be carefully considered by legislative bodies before the vaccination laws now in force are repealed. Such a step would be one of retrogression in preventive medicine.—**THE HOUSING PROBLEM:** This problem has for many years claimed the attention of European physicians and must now be considered seriously in this country. In addition to the dangers to health from overcrowding, dampness, insufficient light and poor ventilation, the relation of preventable noises in cities to neurasthenia and the increasing popularity of flat life with its unhygienic conditions must be considered problems of vital importance, the proper solution of which will have an important bearing on the future welfare of the country. The regulation of buildings and the provision of proper sanitation is a medicolegal function in the performance of which the physician must take a leading part by virtue of his special knowledge.—**THE AGE LIMIT:** Railroad managers are beginning to question to expediency of excluding men of full majority or middle age from employment. While there seems to be no doubt that many men are at their best efficiency before the fourth decade has passed, this is not always the case and there are frequently greater possibilities for usefulness after this period than before. It is probable that of late years we have placed the age limit unreasonably low.—**THE RELATION OF CHLORIDS TO EDEMA:** Many reports have followed the observations and writings of Strauss, in Germany, and of Widal, in France, in 1902 and 1903, on the possibility of edema being due to the presence of abnormal quantities of sodium chlorid in the tissues. The weight of evidence thus far presented indicates that retention of chlorids frequently is an important feature in the edema of nephritis but it is not always possible to demonstrate its relation to the edema. The retention of chlorids seems to depend entirely on the inability of the kidneys to excrete them and the water retention is secondary to this. Chlorid retention has also been observed in some cases of dropsy in heart disease and with some edemas occurring in patients with acute inflammatory disorders, but here it is not so well established that the observed chlorid retention is more than can be explained as due to the retention of the fluid in the edematous parts. In any case the treatment of renal dropsy by "dechloridization therapy" seems to be warranted on several grounds. In the first place, the edema is relieved by this

means, secondly there is considerable evidence that chlorids may act injuriously on the diseased kidneys, and furthermore, there is no danger in reducing the intake of chlorids to as low a figure as can be done by a carefully selected diet.—**THE RELATIVE VALUE OF CULICIDES:** Owing to the importance of the destruction of the mosquito in the prevention of yellow fever and malaria, the United States Public Health and Marine-Hospital Service has been investigating the various culicides. The fumes of pyrofume, a liquid derived by fractional distillation from pine wood, are deadly to the mosquito, but if much concentrated, soften varnish, leave deposits on surfaces and most important the liquid is quite inflammable. The fumes of camphor-phenol possess no powers of penetration, diffuse poorly and are diminished in efficiency by low temperatures. While sulphur so long used in quarantine practice proved effective in tests demanding all the necessity for penetration and diffusion likely to be found in practical fumigation, unfortunately the fumes of sulphur are in a measure destructive, otherwise it would meet all the requirements of a gaseous culicide.—**MAJOR KEAN AND THE SANITARY TRIUMPH IN CUBA:** The improved hygienic conditions that resulted in Cuba after the United States assumed control at the close of the Spanish-American war is an incident of which Americans can justly be proud. So efficient were the services of Major Kean, who was placed in charge of the cleaning up of Cuba, that Havana was soon changed from one of the most filthy and most unhealthy cities in the world to one of the cleanest and healthiest considering the latitude. When the Americans took charge of the Islands again last October it was found that conditions had deteriorated under the independent Cuban regime and Major Kean again brought order out of chaos, entirely stamping out yellow fever and improving the entire sanitary condition of the Island. Considering the fact that the work was done in a country with a strange language and an ignorant population intensely conservative in its habits of life, Major Kean and his assistants have accomplished a task that is a credit to the country and to preventive medicine, and one which should not go unrecognized by the general public.—**THE EUROPEAN WAY:** The seventieth birthday of von Bergmann a short time before his death was made the occasion of a national expression of very real affection by men in various walks of life. In France, in the vote for the ten greatest Frenchmen of the nineteenth century Pasteur was given first

place. The final ceremonies over the body of Berthelot, chemist and statesman, who died recently in Paris, were most imposing and participated in by many men prominent in the government and in the learned societies. Here were three tributes to three great men of science. What was said of Berthelot and Pasteur applies equally well to von Bergmann, "The man in him transcended the scientist and made him as beloved as he was eminent." These great men were and are in memory affectionately appreciated by their countrymen, the European way—and as yet not the American way.—**THE DIGESTIVE ACTION OF LEUKOCYTES:** The role played by leukocytes in removing and dissolving dead tissues depends on the powerful digestive enzymes which they contain and which are liberated from the bodies of the leukocytes on their disintegration. Recent studies by Opie, in the Rockefeller Institute, show that the chief proteid-splitting enzyme of the polynuclear leukocytes differs from the proteid-splitting enzyme of nearly all the other cells of the body in that the former act best in an alkaline medium while the latter act best in an acid medium. The mononuclear leukocytes and the lymphatic tissues from which they come seem to contain chiefly enzymes which require an acid medium while the bone-marrow is the only tissue which contains enzymes requiring an alkaline medium. This observation supports the microscopic evidence that the polynuclear leukocytes arise in the bone-marrow. The failure of living tissues to digest themselves probably depends on the preservation of an alkaline reaction in them by the blood, while the leukocytic enzyme on the other hand is kept in check by the presence in the blood plasma of an "antienzyme." Where this antienzyme is oversaturated by the disintegration of large numbers of leukocytes the enzyme asserts itself and dead proteids are digested.—**THE TRANSFORMATION OF DIABETES MELLITUS INTO DIABETES INSIPIDUS:** In certain types of cases of diabetes mellitus glycosuria may disappear under the influence of a complicating nephritis and may never return. But the disappearance of the sugar with the continuance of the polyuria is not so common. Several cases have recently been reported by Teschemacher in which the glycosuria disappeared even with the patient on a mixed diet, but the polyuria, with thirst and debility, persisted, thus presenting the picture of diabetes insipidus. That this is not a true transition from one disease into the other is doubtful, for in one of these cases the sugar reappeared

after a long period of years. These cases also must not be confounded with diabetics who develop chronic interstitial nephritis with polyuria, in whose urine there is so little albumin that it is readily overlooked.—**EFFICIENCY IN HEALTH ADMINISTRATION:** In an address at the opening of the newly established section of Public Health of the New York Academy of Medicine, Dr. George A. Soper pointed out that the authentic sanitary knowledge now desired by the public was difficult to obtain, first, because universities have neglected to teach, in an adequate manner, sanitary science or preventive medicine, and, secondly, because physicians do not fully recognize their importance as sanitary teachers. The public has not profited to the fullest extent from the available sanitary knowledge because of the general failure under our political system to secure as public officials men with the necessary special training and expert knowledge. As Soper truly says: "In the history of sanitation, the great strides of progress have usually resulted from emergencies." The better way is to make schemes necessary for improvement while there is yet ample time for careful investigation and preparation. Hence public opinion and the attention of those with appointive powers should be continuously directed toward the vital importance of special technical qualifications in our public service.—**TYPHOID FEVER IN THE DISTRICT OF COLUMBIA:** The prevalence of typhoid fever during the past year in the District of Columbia, following the installation of a modern sand filter in 1905, has been a great surprise and disappointment to sanitarians. The report of the commission appointed to investigate this subject will soon be published. The work done by the commission was most thorough and complete. It was found that about 15 percent of the cases were imported, 10 percent being attributable to infected milk and 6 percent to contact, leaving 69 percent unaccounted for. From the evidence presented the commission was unable to present satisfactory proof of the part played by the water-supply in the spread of the disease and so reserves its final decision until investigations now in progress have been completed. The occurrence of most of the cases in the summer suggests that more importance should be given in the spread of the disease to the common house fly and to the increased susceptibility to typhoid fever in warm weather.—**JUDICIOUS LUNG EXERCISES:** Lieutenant-Colonel H. A. Davy, M. D., states that the "setting up" drill by which the military bearing is attained is

wrong in theory and injurious in practice, because it disturbs the normal balance between the respiratory and circulatory systems. Woods Hutchinson claims that athletes are two and one-half times as liable to cardiac diseases, 60 percent more liable to kidney diseases and 25 percent more liable to die of one of the three main infectious diseases of adult life than the average man. For tuberculous patients, lung gymnastics should be interdicted in all but the most favorably progressing cases.—**THE DIAGNOSTIC DOSE OF TUBERCULIN:** Following its introduction by Koch, tuberculin was used without discrimination and its good features were overshadowed by the resulting catastrophies. Löwenstein and Kaufmann, in 1905, advocated for purposes of diagnosis a dose of  $\frac{1}{10}$  milligram repeated three or four times at intervals of a few days. The old Koch method was to begin with one milligram and gradually increase to ten. Roepke, after testing the relative value of different doses on over 700 patients, concluded that it was not entirely the question of dose but also the matter of sudden increase in dose which decided the reaction. He advocated  $\frac{1}{10}$  milligram as an initial dose to be followed in a few days by five times this dose, *i.e.*, one milligram, and a few days later, if no reaction occurred, by five times the second dose. The tuberculin reaction is unquestionably of great value in diagnosis and the procedure is not dangerous if properly carried out.—**GRADUATE MEDICAL STUDY:** The need of graduate technical instruction has been but imperfectly supplied by the graduate school and to meet it more perfectly there has been developed in Prussia and extended over the German Empire a system which furnishes what is essentially free instruction to all physicians. The course of instruction is largely didactic and technical, lasts about two weeks and is carried to the smaller towns and villages. The system is managed by a central committee located at Berlin and is brought to public notice by a special journal which appears twice a month. The plan has been successful from the first so that about one-third of the physicians of the Empire have taken part in the courses. Many features of this plan of postgraduate professional education are applicable to American conditions and should be productive of as good results here as in Germany.—**THE PRESERVATION OF MOSQUITOS DURING WINTER:** Passed Assistant Surgeon Francis of the Public Health and Marine-Hospital Service recently preserved the eggs of the *Stegomyia calopus*, the mosquito responsible for the transmission

of yellow fever, in a dry state at outdoor temperature for a period of six and one-half months. Water was then added and the eggs developed into adult mosquitos; these in turn laid eggs which hatched into larvæ, thus completing the life-cycle. These observations readily account for the propagation of this species in our southern latitudes and indicate the necessity of continued efforts looking to its destruction.

**The Boston Medical and Surgical Journal.**—**SOCIAL LEGISLATION IN GERMANY:** A recent paper on "Social Legislation in Germany and its Influence on the Care of the Sick" by Professor Müller should be of interest to physicians and those interested in social work in America. In Germany there are three kinds of compulsory industrial insurance; first, against disease, second, against invalidism and old age and third, against accident. Under the first every one who works for wages pays two-thirds of the cost of his insurance, the other third being paid by his employer. In return the employe is assured of medical aid through any acute illness he may have and in some instances his family becomes the beneficiary at his death. By the second form of insurance all those over 70 receive a dole and many younger persons if disabled and unable to earn one-third of their former wages. One-half of this amount is paid by the employers' premiums and one-half by the employes'. It thus clearly becomes the interest of insurance corporations to prevent illness and to this end they build sanatoriums and see that the sanitary conditions of tenement houses are satisfactory. The third form of insurance is paid wholly by the employer, hence he naturally takes every means to guard his machinery and to prevent accidents to his employes. The opposition to these laws from physicians who were practically forced either to be insurance doctors or to reduce their ordinary fees finally led to a strike of the doctors against corporations which resulted in higher and more appropriate fees. While conditions in America are quite different from those in Germany yet it is altogether probable that we will sooner or later come to some such systematized method of dealing with this great social problem.—**RENAL CYSTS AND CYSTIC KIDNEY:** It is common in considering cysts of the kidney to separate the occasional renal cyst from the multicystic kidney and to regard the two groups as somewhat different in origin. Then the cyst associated with chronic interstitial nephritis is explained as the result of interstitial changes leading to an obstruction of the tubule with retention of secretion and consequent dilation.

The trend of recent work is against this retention theory and places the origin of such cysts in the period of fetal life. Inflammatory processes are regarded as associated, not causative. Some believe them to be the result of errors in renal development, others give them a modified neoplastic origin. As regards treatment, Lund recommends for the cystic kidney free incision and puncture of the larger cysts and the suturing of the organ in position. The almost constant bilateral occurrence of cystic kidney should be recognized by the surgeon to prevent the removal of one kidney when the other is already insufficient for proper excretion.—**LETTERS ON PSYCHOTHERAPEUTICS:** Many physicians claim to have always practised psychotherapeutics, yet few if any have been able to give to the profession a clear and common sense presentation of their principles of treatment. The recent translation, therefore, by Bruce, of Edinburgh, of a small German brochure by Professor Oppenheim is of especial interest. This small volume is made up of letters addressed to patients and its value lies in its simplicity and in the demonstration which it gives of a practical means of approaching an often extremely difficult problem.—**MEDICAL INSPECTION OF SCHOOLS:** The Massachusetts Board of Education has recently published a small pamphlet for circulation among the school physicians and teachers of the State which draws attention essentially to matters which may be observed in children without detailed physical examination. For instance, certain sections are devoted to, "General Symptoms of Disease in Children," the recognition of which should lead to medical attention. Such instruction placed in the hands of teachers and school physicians cannot fail to be of much value in developing a closer habit of observation on the part of those having children in charge and thereby ultimately improving the public health.—**STREET CLEANING AND HEALTH:** This was the topic of discussion at a recent meeting of the New York Academy of Medicine. Among the difficulties there enumerated of maintaining cleanness of the streets were the multiplicity of officials so that the responsibility of dealing with protests was continually shifted, the fact that the people themselves were often violators of the city ordinances instead of cooperating with the street cleaning department, the too restricted use of water allowed the department, and the lack of power to interfere with the dirt and dust production of building operations. An investigation some years ago showed that city dust

does not, under ordinary circumstances, contain to any extent pathogenic organisms. Notwithstanding this fact there is small question that coughs, colds, and various disorders of the respiratory tract are directly induced by the inhalation of particles of dust. This problem needs further investigation but it is perfectly apparent that more could be done than is now being done and this, public opinion should demand.—**THE BACTERIOLOGY OF MILK:** Professor Conn, of the Connecticut State Board of Health, has recently laid stress on the point that the healthfulness of milk depended, not so much on the number of organisms it contained, as on their character. Some of the bacteria liable to be found in milk are injurious, others harmless and still others distinctly useful. Among the latter are the lactic acid bacteria which prevent the development and growth of other harmful organisms and which are indispensable for cheese and butter making. The kinds of bacteria to be feared in milk are the bacilli of tuberculosis, typhoid fever and diphtheria, and the organism of scarlet fever as yet unrecognized. Milk is also supposed to have some causative relation to the summer diarrhea of children. The present method of judging of the purity of milk by a bacterial standard is unsatisfactory, for this method does not take into account the kinds of organisms present.—**SPIROCHÆTES IN MOUSE CANCER:** Gaylord and Calkins recently reported the finding of spirochætes in 16 transplanted mouse tumors from three different sources, and conclude that while they have not as yet established the etiological relation between this organism and cancer in mice, yet their results are decidedly suggestive. In the last analysis, however, Gaylord's findings reduce to the presence of the organism in the inflammatory tissue about the tumors. Unfortunately the work was not controlled by a study of chronic inflammatory tissue in mice unassociated with tumors. It is feared that such control observations will show that the cause of cancer yet remains unknown.

**Medical Record.**—**THE COURSE OF LYMPHATIC INFECTIONS:** Some years ago Weleminsky showed by the inoculation of guinea-pigs with tubercle bacilli that no matter where the site of the original infection was, first, the local lymph glands, then those lying along the route to the bronchial glands, and finally the bronchial glands themselves were invaded by the infectious process. From the bronchial glands the blood stream and the lungs became infected. These conclusions were assailed by

Beitzke on the ground that the bronchial glands might be infected directly from the blood stream or by inhalation or swallowing tubercle bacilli set free through the rupture of abscesses formed in consequence of subcutaneous inoculation. Weleminsky has just published a rebuttal of these criticisms and offers additional evidence for his conclusions. Much may be said on both sides, but from the evidence so far presented, the bronchial glands must be given a very important place in the mechanism of pulmonary infection. — **EXPERIMENTAL ARTERIOSCLEROSIS:** The attempts to secure a satisfactory explanation for the production or control experimentally of arteriosclerosis have led to the publication of results of experimental work not properly controlled. Kaiserling, for example, drew attention to the fact that sufficient consideration had not been given to the condition of the bloodvessels in untreated rabbits. Again Koranyi, who was one of the first to report that the adrenalin lesions in the vessels could be diminished or prevented by the simultaneous injection of iodids, has found that his results were really due to the oily base of his iodine preparation, and Biland goes so far as to state that the simultaneous use of iodids and adrenalin may even intensify the arteriosclerosis. Recent investigations by Loeb and Fleischer seem to bear out the opinion of Biland. These investigators also found that the injection of potassium sulphocyanate in many cases seems to limit or prevent arteriosclerosis, though their experiments are not as yet conclusive. — **THE DIAGNOSIS OF BONE TUMORS BY AN EXAMINATION OF THE BLOOD:** Schleip has recently called attention to the peculiar blood picture in the presence of malignant metastatic deposits in the marrow of the long bones. This closely resembles that of severe pernicious anemia with the addition of large numbers of myelocytes. He reported three cases, a primary carcinoma of the stomach and a primary carcinoma of the appendix, both obscure in their symptoms and diagnosis and both with metastatic deposits in the bones. The third case was one of diffuse sarcomatous infiltration of the marrow of most of the bones with an involvement of the lymphatic glands. These findings are of importance as giving some clue to a correct diagnosis in otherwise obscure cases. — **THE EFFECTS OF MATERNAL GONORRHEA ON THE OFFSPRING:** Contrary to the general belief that gonorrhea in the mother has no deleterious effects on the offspring beyond a possible ophthalmia, Lobenstein and Harrar have recently shown that in addition to the ophthalmia, the general nutrition

of the infant is likely to fail when the pregnant woman is suffering from gonorrhea. At birth such babies weight less, the initial loss of weight is greater, and the amount of loss regained by the tenth day is less than in normal babies. They also suffer more from febrile and intestinal disturbances. These investigators believe that these results are due not so much to the effects of a toxin given off in the milk of the mother as to the local effects of the disease which vitiate the normal nutrition of the fetus, and to the presence of elevation of temperature of the mother during the puerperium. These facts need general diffusion and offer another strong argument for the need of the prevention of venereal diseases. — **THE DERMATITIS CAUSED BY THE BROWN-TAIL MOTH:** As early as 1901 White and Meek suggested that the hairs of the caterpillar of this moth were the source of the peculiar urticarial type of dermatitis frequently seen in the districts infected. Later Fernald and Kirkland inclined to the view that the effect was purely a mechanical one. A recent publication by Tyzzer shows this belief to be untenable. According to him the dermatitis is produced by a specialized form of short, barbed spines termed "nettling hairs" which probably contain a toxic substance greatly aggravating the irritation produced by the penetration of the hairs. These hairs develop in the caterpillar, enter into the structure of the cocoon and are also found mingled with the long hairs of the brown tuft on the tail of the moth. They also occur in the egg masses and in the winter webs and are blown about in the air. If these hairs are rubbed into the skin, there is produced almost immediately with most persons an itching followed in a short time by a reddening which changes to white if the skin is stretched. They may be distributed by the breeze to underclothes and so produce a scattered urticarial rash. This is a subject which is likely to become of interest to more practitioners as the insect extends its area of activity and these investigations urge us to spare no efforts to exterminate the pest. — **STRONTIUM BROMIDE IN THE TREATMENT OF EPILEPSY:** While a careful regulation of the entire mode of life has a most beneficial effect on the course of epilepsy, the use of bromids must be resorted to for the purpose of diminishing the frequency and lessening the severity of the attacks. A recent investigation by Bennion shows that the strontium salt is to be preferred to the mixed salts of potassium and sodium. Strontium bromide rarely causes depression or cutaneous eruption and its good effects seem to be more

marked in females than in males.—**THE RELATION OF IMMIGRATION TO THE PREVALENCE OF INSANITY:** The constant increase in our asylum population is an indication that mental disease is on the increase. One of the sources of this increase as brought out by Dr. Salmon at the recent New York State Conference of Charities and Correction is in the character of the present immigration. At the present time the Hebrew, Slav and Italian make up a large percent of the immigrants and it will be generally admitted that among the Hebrews especially certain types of mental diseases are very prevalent. The proportion of idiots and mental defectives too in these races is considerably higher than in those making up the bulk of the earlier immigrations. The immigration laws seem to deal with insanity sufficiently effectively but they should be amended to include in the prohibited class all mental defectives and those having constitutional mental inferiority and instability. A serious problem confronts us as regards the character of some of our foreign born population for we need immigration but it must be properly selected.—**METALLIC SUTURES:** Leedham-Greene has recently studied the antiseptic value of metal sutures and has found that gold, platinum, tin, aluminum, magnesium and nickel show practically no inhibitive power on the growth of bacteria and lead and silver only when the cultures are grown at a low temperature. Iron exhibited a variable action depending on whether oxidation was hindered or favored. From a bactericidal standpoint, copper proved the most powerful of the metals and to a less degree its alloys bronze and brass, and though usually considered too irritating for general use has not been found so by Greene. Silver, though widely used, does not seem to possess the proper specifications as to ductility and tenacity, is too costly and its antiseptic power is insignificant. Greene suggests a true bronze consisting of a mixture of copper and tin. These suggestions may prove serviceable for certain cases, though absorbable sutures will probably continue to be preferred for routine use.—**CLOTHING IN THE TROPICS:** A former publication by Major Charles E. Woodruff and a more recent one by Dr. Louis W. Sambon bring out the fact that while white garments reflect the heat rays, the actinic rays pass through them readily; hence if white is worn it should be in conjunction with yellow, red or black underclothing. The negro and other peoples of tropical countries are protected by the pigment in their skin. Dr. Sambon has designed a fabric so woven that it has a

white or khaki effect externally and a colored internal surface, which he thinks will meet all the requirements of comfort and protection for garments for tropical use.—**THE PROPHYLAXIS OF MENINGITIS:** From the studies on the diplococcus of Weichselbaum it seems that the difficulties of its cultivation have been much overestimated and that the organism unfortunately is not as delicate as had been supposed. It succumbs, however, rather readily to exposure to sunlight or drying, probably explaining the inability to isolate the organism from the dust, furniture or objects in the rooms of patients. Investigations into the nasal and pharyngeal secretions of individuals in direct contact with patients have shown that a large percent of such individuals were found to harbor the organism often for weeks or months. Kutscher, in a recent article, concludes that these indirect carriers are responsible for the more or less endemic cases, so that until our knowledge becomes more complete we should insist on isolation with all the usual precautions and most careful disinfection of the nose and throat of those in direct contact with patients before they mingle with other and possibly more susceptible individuals.

**New York Medical Journal.**—**THE HEALTH OF THE PHILLIPINE ISLANDS:** The annual report of the Bureau of Health of the Philippine Islands for the year ending June 30, 1906, calls attention to the comparative freedom from disease which those who are willing to follow the simple rules recommended by the Bureau of Health have enjoyed during the year, although constantly exposed to highly contagious diseases. The cases of smallpox, malaria and typhoid have lessened considerably, due chiefly to prophylactic measures, prompt isolation and disinfection. Cholera is being confined to narrow limits but only by the strictest vigilance on the part of the health officers. The consumption of milk by babies has increased but the deathrate has not been appreciably lowered, largely because the people do not yet understand the proper method for keeping milk fresh. Of the 4,000 to 5,000 lepers in the Islands, the Culion Colony is able to care for about 800 in comfortable and good sanitary conditions. The scientific men in charge of this work are deserving of much credit for their energy and ability.—**TRACTS FOR VENEREAL PATIENTS:** At a recent meeting of the American Society of Sanitary and Moral Prophylaxis Dr. Cabot emphasized the importance of teaching venereal patients by means of printed slips. He has for some time distributed such

tracts to his patients in public clinics. The rules embodied in them are wholesome and comprehensive and cannot but have a good result in lessening the spread of gonorrhea and syphilis. A resolution was adopted recommending that the State Board of Charities be requested to require all dispensaries and hospitals to distribute such tracts to all venereal patients.—**BLOOD DISEASES AND LIGHT THERAPY:** Recent reports have considerably advanced our knowledge regarding the use of light energy in the treatment of leukemia, pseudoleukemia, polycythemia, splenic anemia and pernicious anemia. According to Capps and Smith the lymphoid cells after exposure to the röntgen rays give off a leukolytic substance, which injected into the body of another animal, causes a marked decrease in the number of leukocytes, particularly of the uninuclear and myelocytic varieties. Pancoast's report dealing more with the clinical aspects of this subject calls attention to the dangers of röntgen-ray treatment and the necessity for conservatism in its use, and to the fact that only a little over 6 percent of cases of leukemia treated by the röntgen rays are alive and well three to six years after the primary symptomatic cure. The important fact is also brought out that autopsies in leukemias and pseudoleukemias often reveal deepseated lymph deposits which are manifestly beyond the reach of the röntgen ray. In such cases the leukolytic serum might render valuable service.—**THE METHOD OF INFECTION WITH TRYPANOSOMES:** Contrary to the idea put forth several months ago that the transmission of the *Trypanosoma gambiense* from man to man took place by the soiling of the proboscis of the *Glossina palpalis* is that of Schaudinn, whose studies on other protozoan parasites reveal the fact that in the propagation of such an organism there is a sexual form of the organism with encystation. Minchin suggests that these cysts are probably accidentally swallowed by some unknown vertebrate host and after proper development again enter the blood to be again ingested by some insect or fly. He states that there are two possible modes of infection by protozoan blood parasites through biting insects; first, the inoculative method in which the parasite, after undergoing certain developmental changes in the insect, passes back again to a second vertebrate host through the proboscis, as for example malaria transmission; second, the contaminative method in which the parasite, taken up by the insect, undergoes development and is discharged through the anus and infects its host by contamination of its food or drink.—**THE DUT-**

**TON MEMORIAL:** The managers of the Liverpool School of Tropical Medicine propose to found the Dutton Memorial Research Professorship of Tropical Medicine in commemoration of the self-sacrificing work of Dr. Joseph Everett Dutton. He published the first description of the trypanosome in sleeping-sickness and later died of African tick-fever. His work in both of these diseases is well known and is of a very high order.—**THE RELATION OF THE KIDNEYS TO METABOLISM:** A recent communication points out the fact that the removal of three quarters or more of the total kidney weight in cats is followed by loss of appetite, wasting and death in a few days or weeks. An increased output of nitrogen is not of constant occurrence and takes place only in animals which have lost 22 percent or more of their initial weight. Therefore it may be assumed that the kidneys have no direct influence upon nitrogenous metabolism and that the increased nitrogen output is simply the result of inanition. The question arises as to whether we may conclude that in extensive renal disease in man, the primary effect is upon the nutrition of the patient and the disorders of metabolism a secondary result of this inanition.—**MATRICULATION REQUIREMENTS:** Ever since the establishment of the first medical school in this country, the entrance requirements have been gradually increased until now they are equal in most schools to those required for admission to the first year in college. The University of Pennsylvania, following the lead of Johns Hopkins University, has recently instituted changes which are to take effect gradually so that by 1910 it will be necessary for the candidate for matriculation to have completed work equivalent to that prescribed for the freshman and sophomore classes in a recognized college. The fact that prospective students of medicine have spent two years in a literary college will not necessarily make them good medical students or endow them with common sense, which is a quality much to be desired in the student as well as in the physician. Any increase in the requirements is also to be regretted which makes it more difficult for the poor but earnest student to secure an education in medicine. In other words, while it is quite right to require a high standard of attainment, it ought at the same time to be made possible for poor men to attain that standard.—**GUNSHOT WOUNDS OF THE HEAD:** Two monographs recently published by Dr. August Hildebrandt, of Berlin, the one on the effects of small calibre projectiles on the human

body, the other dealing especially with shot wounds of the cranium, bring out among other things the following conclusions: "With regard to the advisability of immediate operative interference in shot wounds of the head, in the absence of coma, the surgeon should go forward in: 1. All shrapnell and shell wounds of the cranium. 2. Glancing and tangential shot injuries of the cranial vault. 3. Deep penetrating injuries caused by small calibre projectiles of the modern rifle, more especially when symptoms of cerebral compression or irritation (of the cortex) are present (tonic or clonic convulsions). The same advice holds good in cases of persistent paralysis and derangements of speech." The fact is also emphasized that in those cases, where for any reason the operation cannot be undertaken, infection invariably sets in.

**St. Louis Medical Review.**—MUNICIPAL HOSPITAL REFORM: Recognizing the viciousness of a system of public health in all its branches that placed the entire work thereof at the mercy of political appointees, noting the good results that have followed the severance of the educational system from political control and realizing the almost unlimited room for expansion of the medicine of the Middle West, the medical profession of St. Louis, as represented by its 11 societies, in 1905 established a Joint Medical Council. This body undertook to work for municipal hospital reform. The defects found were largely consequent on the fact that all appointments to the hospital were subjects of political patronage. The remedy proposed consisted mainly in a complete severance of the hospital department from the health department and the election of a Board of Trustees by the people in which the control of the hospital should be vested.

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## NEWS AND NOTES.

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**Hospital Camp at Jamestown.**—Arrangements are being made by the bureau of medicine and surgery for the establishment of the hospital camp at Norfolk, Va., during the period of the Jamestown Exposition, with Surgeon John F. Urie in charge.

**Plague in India.**—Government returns show that the deaths from the plague throughout India, for the six weeks ended May 11, reached 451,892. In the Punjab alone 286,777 deaths occurred.

**Drug Trust Enjoined.**—By reason of a complaint made by the United States Govern-

ment, a decree has been entered in the United States Circuit Court of the district of Indiana, by which the "Drug Trust," so-called, is perpetually enjoined from combining and conspiring to restrain trade in drugs, fix prices by agreement, blacklist retailers who cut prices, or to refuse to sell to any retailer on equal terms. All publication of blacklists is forbidden, and all contracts and agreements covered by the charges are declared void. The direct contract serial number plan is prohibited, as well as the securing of the adoption of schedules for the sale of drugs.

**To Regulate Practice of Vivisection.**—A bill pending in the New York State Legislature provides that experiments on living animals which are calculated to produce pain shall be performed only under authority of the faculty of the college or university or under the authority of the State Commission of Health or of the Board of Health of a city; that the buildings in which such experiments are conducted shall be registered with the proper authorities; that every animal subjected to such experiments shall be placed under the influence of an anesthetic sufficient to prevent it from feeling pain, and that when the consequences of the experiment are likely to continue after the experiment is over the animal shall be killed while under the influence of the anesthetic.

**Sale of Absinthe Prohibited.**—A referendum in the Canton of Geneva has ratified the law prohibiting the sale of absinthe by a vote of 7,841 to 7,081. The vote will act as a great encouragement to the antiabsinthe movement, and the extension of the law throughout Switzerland now appears to be certain.

**Campaign Against Tuberculosis.**—It is reported that the campaign which has been instituted in Louisiana to combat tuberculosis is accomplishing gratifying results. The campaign is mainly one of education in conjunction with the reporting and registration of all cases of the disease, so that assistance may be given to the sick and care exercised to prevent the spread of the disease. A sanatorium is to be built in which the measures for the care of these sufferers may be effectively carried out.

**Spinal Meningitis in Prussia.**—During the five months ended with March there occurred 6,314 cases of spinal meningitis in Prussia, with a mortality of 44 percent. In 1905 the mortality was 70 percent.

**Dental Clinic.**—The municipal authorities of Erfurt have decided to establish a dental clinic for the school children of the town. The number of children is 10,000.

# American Medicine<sup>33</sup>

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**Cold storage foods** are being investigated by the Bureau of Chemistry with a view of determining how long it is safe to keep them without the use of preservatives. This is a most important study in which the chief of the bureau, Dr. Wiley, deserves cordial support. It is regrettable that the matter should have been treated in a flippant tone by some newspapers. As we have repeatedly mentioned, the modern concentration of population far from the farms where food is raised, could not occur except for cold storage, as otherwise fresh foods would be unattainable in warm weather. Luckily most foods are improved by keeping—the time being dependent upon the article, the season of the year and climate; but there is a limit of safety as shown by the dark record of digestive disturbances in travelers dependent upon foods of unknown source. Dr. Wiley and his assistants are already discovering facts of considerable value.

**Publicity of Food Investigations.**—It would be wise to publish the results of Wiley's work in considerable detail. It is generally believed, for instance, that meats may be safely frozen indefinitely, but it now appears that after three months there is a noticeable deterioration which probably changes the digestibility and nutritive value—a serious matter to our soldiers in the tropics whose beef is often kept six months or longer. It is surprising to learn that undrawn poultry might keep better than the drawn. There are other facts actually cry-

ing out for recognition, to put an end to the abuses of this modern necessity, by laws limiting the period for cold storage.

**The adulteration of foods** is a matter which will not down, and the more often it is discussed the better—for it is undoubtedly a great scandal, even in the cases where the adulterant is not harmful to health but merely a degrading fraud. The recently published investigations of the Connecticut Agricultural Experiment Station are really appalling in the revelation of what a large percentage of samples proved unfit for use—milk, butter, sausage, hamburger steak, and the like. The percentage of harmless but fraudulent adulterations is also discouraging—olive oil, syrups, confections, coffee, spices, flavors and condiments. It almost gives the impression that the majority of food producers are really scoundrels. Where is the honest farmer? It is high time for the consumers to control the situation—they have been the under dog long enough. If a lot of the offenders are locked up as public enemies, the rest might come to their senses—if they have any.

**Making children self-supporting at ten** is the horrible suggestion of a Chicago pedagogue. A farmer will not let a horse be self-supporting until its tissues are well grown, and no child can support itself until it is near the adult period. We have called attention to the fact that children have always helped to support themselves, and that the

work, until the deadly modern factory arose, was invariably wholesome, more or less outdoor exercise, in a rural environment. Work of itself is normal, and believed to be needed for development. If we do not impose it, children invent it for themselves. We have also mentioned the fact that the modern poor man still needs the child's assistance if the family is large. If the law demands schooling, as it undoubtedly should—to some extent at least—then the instruction should be of a character to enable the child to help its parents as soon as possible. There is a growing impression that we must modify our schools to this end, by introducing the training features formerly part of the home life, but now impossible in crowded industrial communities.

#### **The Normal Life is the End in View.—**

It is merely returning to nature, to keep the child out of the murderous factories. But all this is far from saying that a child can or should be made self-supporting until it has the bones, muscles and nerves for the purpose. The idea of industrial training in schools should not be carried too far. It is merely to prepare the child for the time it can safely cut loose—somewhere after eighteen or even twenty-one, the good old legal age at which the child is freed from the compulsory duty of helping its parents. Pedagogues are optimists, as a rule, and make unbounded claims of the good they are doing, but they must not exaggerate the field of usefulness of the new educational plan or they will injure the cause of public health. To render a child self-supporting at ten, is merely modified murder. The real thing to teach a child, is the fact that work is the road to health and happiness and that if they are taught to work early when they can learn best, they are being blessed beyond measure. They must know that God did

not curse man to eat bread in the sweat of the brow and the clergy must properly interpret this part of the Bible.

**The filthiness of school children** is the amazing revelation of the recent examinations to determine their physical condition. The defects discovered were well known, but it is far from pleasant to know that many are not bathed for months at a time and that some had their underclothing sewed on. Savages may live this way with more or less impunity yet even, with them it is the cause of epidemics. In civilization it is appalling, in the prospects of transmission of disease, in schools. The nauseating sour odor in a room filled with poor children is a sign of criminal, though ignorant neglect of parents. There is an opportunity here for another movement of our home missionaries—both religious and medical. Let them spread the gospel that cleanliness is next to godliness. Let there be less soup and more soap in our charities, and then we will diminish pauperism and disease at one stroke.

**The tolerant immunity of "carriers of infection"** is a matter which must be reckoned with in the future in all matters of hygiene and sanitation. It has been learned that every species of animal, in the course of time, and through the action of the ordinary laws of selection, is able to establish a toleration for parasites which were perhaps at one time very fatal. It is not immunity but toleration of invaders, and these animals, though in perfect health, are sources of fatal infection to those varieties or species which have not developed toleration. Domestic cattle imported into Africa perish from trypanosomes or other parasites which live harmlessly in the native stock and wild animals. Immunity exists where the invaders are destroyed and possibly it develops in

time from the condition called "tolerance," which itself seems to be a different phenomenon from "commensalism" or "symbiosis" in which the two organisms exist together by reason of some kind of reciprocal benefit or mutual aid.

**Human tolerant immunity** is also a proved fact. The natives of the tropics tolerate the malaria plasmodium which is often found in 80 to 100 percent of those examined. It is far from immunity, nevertheless, as they promptly develop symptoms and may even die of malaria, if they lose resistance through overexertion, starvation or some other infection. Natives, therefore, though in apparent good health, are carriers of a fatal infection to Northern races who cannot "tolerate" the organisms. In a variable period after many infections, particularly typhoid and cholera, a convalescent "tolerates" the organisms before he finally destroys them. They may be recovered from the urine or feces for many weeks or months. It now appears that "tolerance" is a quite common phenomenon, existing as an individual characteristic of many men living in a susceptible population. These are the newly named "carriers" of infection. It is thought to be acquired as a result of the repeated invasion of attenuated organisms. Where typhoid or cholera is common, the organism is found in quite a percentage who never develop symptoms. All the members of a farmer's family might be "carriers," if their water-supply is infected, but a visitor promptly acquires typhoid.

**Diphtheria carriers** have been known for a long time. Indeed it was only shortly after the recognition of the bacillus as the true cause, that it was found in many people who seemed to be healthy. Convalescents also establish a tolerance and the

bacillus is sometimes recovered from their throats for weeks or months, though it generally disappears fairly soon. It is beginning to be suspected that these carriers are the only ones who keep up and spread diphtheria infection. If this is true—and it bears the earmarks of truth—then it logically follows that house disinfection after diphtheria is a useless expense, for it is directed against extruded organisms which are probably dead even if they are present on the walls or furniture. The true foci are in the throats of the carriers and they must be more or less isolated until several cultures fail to reveal the organism.

**Pneumonia carriers** have also been recognized for a long time, indeed in some localities the organism is occasionally found in the mouths of 20 percent or even more. It merely waits an opportunity and succeeds in the end, as a rule, unless some other agent kills the carrier prematurely. We carry the instruments of our own demise. In the meantime the carriers spread the infection to those who are not "tolerant."

**Are there carriers for every infection,** one naturally asks? Staphylococci and streptococci are found, the gonococcus may be carried for years, and perhaps every known pathogenic bacterium could be found if the rule holds good. Even in the diseases of unknown cause—the exanthems—we find every grade of case from the fulminant and malignant to those so mild that symptoms are detected with difficulty, and it is logical to assume that there are carriers who have no symptoms—say in scarlet fever and measles. One stands aghast at these new revelations, for they indicate the improbability of ever eliminating infectious diseases, no matter how much we may limit their severity or spread. They point out a

new direction for sanitary efforts, by guarding against carriers. Milk, for instance, has been infected with typhoid by a dairyman carrier, when no disease was evident. The facts may be well used as arguments by both the advocates of pasteurization and of rigid inspection of municipal milk supplies. Now that we are systemizing our protective arrangements as to the sick, we must turn to the carriers for renewed exertions.

**Fleas as carriers of plague** have been suggested and strenuously denied in language far from polite. It now seems that the flea is the guilty party after all, and it illustrates a very human fault of entering into heated discussions before there are any facts upon which to base an argument. The government of British India appointed a commission to try the flea, and it is reported to have found him guilty. Extensive experiments left no doubt of the fact, and, moreover, the theory is announced that plague might really be a disease of fleas, higher animals being incidentally infected. It was thought at one time to be a rat disease, as it appeared in them long before men were infected in any locality. It is known, nevertheless, that rats do carry it from place to place, the flea merely transferring it from one animal to another. Perhaps the flea may be found to be a true carrier, not really diseased by it nor acting as a medium of mechanical transfer, like the flies in spreading infection by their legs.

**The effects of alcohol** were discussed by Dr. Winfield S. Hall,<sup>1</sup> at the 1906 meeting of the American Medical Association, and his paper contains several statements which cry out for comment. Dr. Hall has long been known for his opinion that alcohol is not a food, though his definition of a food is in-

geniously contrived to exclude such foods as alcohol may really be. It does seem as though he had formed his conclusion first and has been industriously seeking support for it ever since, though unsuccessfully. In his preliminary argument, he stated that "only those organisms which possess chlorophyl are able to build up complex food substances from simple inorganic compounds," and that "organisms not possessing chlorophyl are unable to utilize the inert organic materials of their environment. They are dependent on the chlorophyl-bearing plants for their food." This is amazing as coming from a physiologist, for it is well known that numerous species of bacteria do live on inorganic substances, and some of the soil bacteria actually obtain their nitrogen from the air.

**Alcohol as a food** was also discussed by Dr. Hall, who stated that it is an excretion, toxic to the fungus which excretes it, and, therefore, toxic to all higher organisms, and therefore toxic to man—remarkable reasoning in view of the fact that he also states that alcohol is the pabulum for the bacterium of acetic acid fermentation. He states that alcohol "is also toxic to the protoplasm of all higher plants."

**Alcohol as a Vegetable Food.**—In *Science* for December 12, 1902, there is an address of Professor J. Reynolds Green, as president of the Botanical Section of the British Association, and it bears upon this point. He mentions experiments which prove that numerous plants can be fed on alcohol. He also shows that plant cells take into their protoplasm the sugar molecule unchanged and that the subsequent changes make it quite probable that it is fermented by an enzyme into alcohol and carbonic acid. The latter is excreted and

<sup>1</sup> Journal, February 2, 1907.

the alcohol is the part which the cell utilizes and assimilates for its energy. It is disheartening to find these discoveries of plant physiologists ignored by Dr. Hall.

**Alcohol as an Animal Food.**—Green also states that there is no essential difference between the protoplasm of plant and animal cells. Alcohol then, perhaps, might be one from our own carbohydrates assume in their oxidation in the body of the cells. If so, it is a real food. We regret that alcohol discussions, such as Hall's, should be one-sided and unscientific and that they apparently seek to prove a dogma and not seek the whole truth, for such conduct only injures the cause of temperance by casting discredit upon real scientific work in this line. Too little is known of the formation and disposition of glycogen in the liver to deny that alcohol might be a stage of its decomposition. It is a subject for investigation, not for dogmatism.

**Alcohol as a food for diabetics** has been advocated by many able practitioners, not only on scientific grounds but also from experience of its benefit. It is assumed that carbohydrates are broken up into alcohol at one stage of their oxidation through enzymes produced by the pancreatic cells in the "islands of Langerhans" and perhaps by other cells also. When the pancreas is disabled by organic disease or by nervous disturbance, the sugars are drained off. Carbon nutrition can then be sustained by alcohol as well as the fats. Benedict and Torok<sup>1</sup> go a step further and announce that the fats as well as the proteids produce acetone, and assert that their experiments prove that by substituting alcohol in moderation—one half to a liter of light wine a day—for the fats, nutrition was kept up, and that there were

very happy results in a marked diminution of acetone and sugar in the urine. These reports should be verified, for it is a most important matter, involving the lives of our patients. If they are verified, it would be a serious offense for Dr. Hall or any other physician to keep alcohol from diabetics on the dogmatic ground that it is always a poison and never a food. It might destroy lives which could be saved.

**The parallelism of diabetes and obesity** has been noted a long time and now seems to be of some therapeutic importance, particularly as the two conditions are not infrequently found in the same patient. It is now fairly well accepted that the digestion and metabolism of the carbohydrates are results of the actions of enzymes. The digestive ferment renders the carbohydrates soluble and after absorption the other enzyme breaks them down to simpler forms. If one process is defective, there is indigestion and starvation for that class of food, if the other is at fault the absorbed materials drain off. It is now suggested that a similar set of processes attend the fats, which are broken up into fatty acids by the intestinal ferment lipase, and absorbed in this soluble form and not as an emulsion. Later the enzyme reverses its action and forms fats which then enter the blood for distribution. Normally they are broken down by other enzymes produced by the thyroid or other glands and when these are defective, obesity results. As the fats are also synthesized from carbohydrates and protein, the obesity results whether fats are eaten or not.

**The Future Treatment of Diabetes and Obesity.**—Certain forms of obesity are undoubtedly benefited by the enzymes in thyroid extract, though not cured; for it is a

<sup>1</sup>Zeitschrift für Klinische Medizin, vol. 6.

question of glandular or other organic disease which is often accompanied by other more or less serious conditions, particularly of the nervous system. The thought naturally arises, that if all these modern speculations prove correct, why should it not be possible to keep diabetics alive and in good condition indefinitely by administering the proper enzymes when we find them. There is then a possibility of conquering not only these two conditions, but all others which are due to glandular failure or disturbance. It is not the old organotherapy, which was marred by an unfortunate empiricism, if not by downright quackery, but a scientific administration of substances which our own glands fail to produce. "Diet" would then be banished, for it would not be necessary to modify the usual food proper for the healthy person of that age. It is not a cure, but is like giving an artificial leg for the one amputated. The patients will still be defective and more or less inefficient, but they will live in comfort whereas they now often perish too soon even with the greatest care in managing diet and exercise. It sounds utopian but it is a promising field for the institutions devoted to research.

**An unreasonable champion of alcohol** has appeared in the person of Dr. J. Starke, a German physiologist and dietetist. To be sure he bases his arguments on such well-known facts as the presence of alcohol in the tissues at all times, and the fact that when artificially made and ingested it burns up to produce energy, but in his conclusions he is an extremist who will not receive the support of that part of the profession whose opinions are worth quoting. His denial that alcohol is never a poison is simply untrue, but it must be wormwood and gall to physiologists like Dr. Hall. He states the well-known fact that alcoholism—the craving for

the narcosis—is a sign of mental abnormality and weakness, but his theory that moderate drinking by the healthy never produces the habit, is sure to raise a storm of protest, for facts seem to be against him.

**Condemnation of total abstinence** is risky business. There may be some who agree with Starke that small amounts of alcohol are not harmful, but when he advocates its habitual use as an aid to digestion and cerebration, he is on debatable and highly dangerous ground not only scientifically but ethically. He advocates its use to aid invention and by the very ones who appear to be the most damaged by it—the unstable neurotics who are highly gifted creators, artists, writers and men of genius generally. It does seem that his advocacy is scientific fanaticism as harmful as that of the opposite extremists who are far from scientific. His temperance is as intemperate as that of the "temperance" faction. A balance wheel is needed by both. Hall advises total abstinence as a necessity for the healthy, and Starke practically advises everyone to drink moderately as a necessity. When two physiologists use the same scientific facts for such opposite conclusions, it is a scandal which reflects upon the science itself. The whole brood of dietetists are in discredit, anyhow, for the science of feeding is the host for a horde of parasitic fads from vegetarianism to "chewing." A house-cleaning is sorely needed in and out of the universities. "Let digestion wait on appetite."

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**Scientific Investigation of Working Classes.**—A new office has been created in Berlin by the British Government to provide for a regular scientific investigation of the conditions of the Berlin working classes, with a view of obtaining ideas for the improvement of similar classes in England.

## BOOK REVIEWS.

**The Prophylaxis and Treatment of Internal Diseases.**—By F. FORCHHEIMER, M. D. D. Appleton & Company, New York and London, 1906.

In these days of therapeutic nihilism, a good text-book on the treatment of disease is eminently welcome. By depicting the methods, medicinal and nonmedicinal, employed by a successful physician in his practice, such a book will serve to stem the tide of an erroneous philosophy that, if allowed to go unchecked, would greatly impair the usefulness of the art of medicine. The book before us has the qualifications necessary for the performance of this function; it does not disparage the value of drugs, nor does it neglect to give due weight to physical and other means used in the treatment of disease. It possesses a striking degree of individuality, and is not, as are so many recent works, a mere compilation of the opinions of others. The author has set himself a high goal—to discuss in detail not only the treatment of disease, but also the methods of disease prevention. Others have undertaken this, but generally in a mere perfunctory way; Forchheimer does it purposively and systematically. In its general arrangement of chapters, the book follows the plan of modern works on practice, thus wisely avoiding the very crude method of alphabetic arrangement. Aside from perusing this work for the purpose of review, we have made use of it in practice, and in this, the best of all tests, it has not been found wanting. The newer synthetic compounds, particularly those of German manufacture, are frequently mentioned; this is quite defensible, although many who use them in private hesitate to refer to them in their lectures or in their writings. If such synthetic articles have value, any information from an authoritative source should be welcomed. If the author would, in future editions, give the more important references of articles mentioned in the text, it would add still more to the value of his great work. The book will be a standard in therapeutics as Osler's is in practice.

**A System of Medicine.**—Edited by THOMAS CLIFFORD ALLBUTT and HUMPHRY DAVY ROLLESTON. Volume II, Parts I and II. The Macmillan Company, New York, 1906.

Volume II of the revised edition of Allbutt's System appears in two parts, each the size of Volume I. Part I, which really represents Volume II of the old edition, continues the discussion of Infective Diseases and also includes the consideration of the Intoxications. Opening the volume is a most instructive article on The General Pathology of Infection by Professor James Ritchie; its thoroughness is attested by the fact that 125 pages are devoted to the subject of Immunity. Syphilis has been transferred from the diseases of uncertain bacteriology to the "Chronic Infections of Established Bacteriology." Dr. Hutchinson, however,

after stating that "One of the most noteworthy discoveries of recent times is that of the specific parasite of syphilis," assumes the defensive attitude adopted by many of those who accept the *Sp. pallida* as the cause of this disease by saying later that "we may, therefore, with some confidence assume that the true causal parasite of syphilis has been discovered." Considering the views of many of the laity and not a few members of the profession, the article of Dr. John C. M'Vail on Vaccination as a Branch of Preventive Medicine is very timely. Part II form an essentially new volume for the System. It is devoted to two subjects, Tropical Diseases and Animal Parasites, being intended to serve as a complete work on Tropical Medicine. Sir Patrick Manson contributes an introduction. As showing the modern tendency of medicine to draw upon zoology, this volume is begun with four Zoological Articles, dealing respectively with Protozoa, Mosquitos, Blood-sucking and other Flies Known or Likely to be Concerned in the Spread of Disease, and Ticks. These form a very valuable portion of this part. The difficulty in limiting the range of the title "Tropical Diseases" is shown by the inclusion under this heading of the "Spotted Fever of the Rocky Mountains." The names of the contributors to this Part, including Minchin, Theobald, Stephens, Low, Leishman, Thayer, Ross, Manson, Sandwith, Flexner, MacLeod, Cantlie, and Fayrer, are a sufficient guarantee of the most authoritative discussion of the various subjects therein treated. Collectively these articles form an admirable presentation of tropical medicine. The volume as a whole maintains the high standard of the first and is further evidence of the sterling value of the revised edition.

**Pathogenic Microorganism, including Bacteria and Protozoa.**—By WILLIAM HALLOCK PARK, M. D., assisted by ANNA W. WILLIAMS, M. D. Second edition. Lea Brothers & Co., New York and Philadelphia.

Dr. Park discusses principles of bacteriology, bacteria pathogenic to man individually, and protozoa. In this edition 78 new illustrations, many of which are original, have been added. A most interesting chapter on the bacteriology of milk in its relation to disease shows the result of considerable original work on the part of the author. Another chapter on the nature of the substances concerned in agglutination depicts the strides made in bacteriology in a few years. The section upon the protozoa is entirely new and completes a volume that has only itself to improve upon.

**Conservative Gynecology and Electrotherapeutics.**—By G. BETTON MASSEY. Fifth revised edition. F. A. Davis Company, Philadelphia, 1906.

In this edition the author has further elaborated the cataphoric treatment of cancer and added more data on the use of the constant current derived from street mains.

## CORRESPONDENCE.

## THE TERMS "VACCINE AND VACCINATION."

BY

DAVID RIESMAN, M.D.,  
of Philadelphia.

To the Editor of *American Medicine*:—Objections have been made to the use of the terms "vaccine and vaccination" to denote the injection of killed bacteria in the treatment of disease, a method which is the outcome of the opsonic work of Sir A. E. Wright. These objections base themselves on three considerations:

1. On etymologic grounds—the word vaccine being derived from vacca—a cow.

2. On the ground that vaccine and vaccination have a specific connotation based on the Jennerian principle.

3. On the fact that vaccination is a prophylactic measure, while the injection of dead bacterial cultures is used principally for curative purposes.

While I am not prepared to admit that all these objections are well grounded, nevertheless, it seems desirable to have a different set of terms to indicate the new method, and, I would, therefore, propose the following: Bacterine and bacterines for vaccine and vaccines; bacterinate for vaccinate; bacterination for vaccination. Any or all untoward symptoms that might follow bacterination might be designated by bacterinia. I am aware that the termination of these words is Latin, while the root is of Greek origin; but that is not a serious objection, if the words otherwise express the ideas they are intended to express.

## A MISINTERPRETATION.

BY

S. A. KNOPF, M.D.,  
of New York City.

To the Editor of *American Medicine*:—You doubtless have heard of the slanderous interpretation of my remarks in Washington concerning the administration of morphin, which was published in the *North American* of May 8. I am sending to you a copy of a letter from Dr. Dock, who presided at the meeting, which I ask you kindly to publish in your next issue. It speaks for itself.

Dear Dr. Knopf:—

I did not know until Friday about the outrageous report in the papers. Curiously enough, I was walking away from Dr. Osler's address beside a gentleman who discussed the

same and a Philadelphia doctor. The latter spoke of the report in the *North American* and we both condemned it in the most vigorous language. It then appeared that the other gentleman walking with us was one of the editors of the *North American*. He had nothing to say in his own defense. I heard clearly what you said. I am sure I know what you meant, and am sure that everybody in the room must have understood what you said. Your words could not possibly be converted into the meaning given in the *North American*. It was perfectly clear that you meant to relieve patients in the last stages. Everybody knows that this prolongs life, while making it very much easier for the patient. The publication of such an outrageous lie is a most shocking thing in its possible effects on thousands of invalids all over the country. When, in addition, one thinks of the possible effect it may have on a man's influence, not to mention livelihood, it seems as if no punishment could be too severe for those who originated and published the same.

Signed:

GEORGE DOCK.

**Tuberculosis in Cuba.**—While the mortality has diminished, from 1900 to 1905, inclusive, deaths from this disease have proportionately increased in each 1,000 deaths from all causes, and are greater in number than from all other infectious diseases combined, as follows: Deaths in island from tuberculosis out of each 1,000 from all causes: 1900, 139.46; 1901, 157.34; 1902, 162.72; 1903, 187.92; 1904, 207.95; 1905, 202.16. Under the government of intervention, in addition to the organization of dispensary treatment for individuals in the early stage of tuberculosis unable to leave their families or occupations, together with instruction in the importance of living and sleeping in the open air, special wards were set apart in the hospitals for advanced cases. In order still further to check this disease and to extend facilities for fighting it, the provisional governor has recently appropriated the sum of \$60,000 for the construction of the necessary machinery and equipment for the establishment of a free tuberculosis sanitarium for the poor of both sexes, to accommodate 50 persons, the number to be doubled when the capacity of the institution has been enlarged.

**Old Age Pensions.**—Belgium adopted the scheme in 1900, and in the same year Victoria passed an act granting \$2.50 a week to any old person who fulfilled certain conditions.

## ORIGINAL ARTICLES.

### THE THERAPEUTICS OF BRIGHT'S DISEASE BASED UPON ITS ETIOLOGY.

BY

WILLIAM HENRY PORTER, M. D.

Professor of Pathology and General Medicine at the  
New York Post-Graduate Medical School and  
Hospital; Attending Physician to the  
Post-Graduate Hospital, etc.

It is assumed, as a fundamental premise, that all therapeutics, to be scientific, must aim primarily to remove the underlying etiologic factors of disease. Hence, in this discussion, the main object is to review briefly the conditions that tend to excite pathologic changes in the renal structures. This accomplished, the general principles which govern the management of this class of diseases can be easily and intelligently elucidated.

Speaking briefly, under the common term Bright's disease there are three general classes to be considered. *First*, one in which the pathologic changes are confined largely to the epithelial elements constituting the renal structures, and classed as a parenchymatous lesion. *Second*, one in which the major lesion is located between the tubules, in the form of a more or less abundant production of newly formed connective-tissue substance, and classed as an interstitial lesion. *Third*, one in which the epithelial and connective-tissue elements are more or less equally rendered pathologic and classed as a diffuse lesion. Among the connective-tissue changes are included those found in Bowman's capsule, the basement substance of the tubules and in the vascular walls.

Between the purely parenchymatous and interstitial types there is a wide range and variation in the nature of the lesion, as seen both macroscopically and microscopically. The same holds true in relation to the clinical phenomena and in the urinary findings. So much so, that a number of different forms can be recognized during life and confirmed with absolute certainty at necropsy. The parenchymatous and interstitial, as well as the diffuse group, are cap-

able of certain well-defined subdivisions, all of which are well illustrated in Table I.

If to the chronic parenchymatous type there be added a more or less deep congestion as occasionally occurs, the lesion is sometimes classified as a hemorrhagic nephritis. This is not, however, as some are inclined to consider it, a separate form of renal lesion. It is simply a modification occasionally seen in the chronic parenchymatous group, brought about by a more pronounced disturbance in the circulation than is commonly the case. Even this condition is not an inflammatory process in the strict application of this term. Hence, to classify this lesion as hemorrhagic nephritis, thereby indicating that we have a separate and distinctive type of renal lesion inflammatory in nature, to deal with, is decidedly misleading to say the least. This same line of reasoning, so far as the use of the term nephritis is concerned, holds true in connection with nearly all the different forms of renal lesions classed as "Bright's." This is well illustrated in the table of classification. At this point it is well to emphasize the fact, that, with the single exception of the exudative or acute diffuse type of lesion, all the other forms of renal disease classified as "Bright's" are noninflammatory processes. They are all changes which are brought about by conditions that augment the work of the renal glands at a time when their nutritive activity is abnormally affected. Hence, the term nephritis has been largely discarded by all pathologic investigators. The recognition of this important fact is absolutely essential if we are to interpret correctly the etiologic factors which enter into the production of the lesions of the kidneys commonly classed as Bright's disease.

With this brief review of the pathologic lesions of the renal structures we can consider intelligently the etiologic factors that enter into their production, and also the best measures for preventing or removing these factors when once set in motion.

So long as the work imposed upon the renal glands is not too great, and the nutritive supply is of the right kind and quality, the various

structures of the kidney will maintain their normal integrity. Under such conditions no pathologic changes can be produced. On the other hand, if the work of these glandular structures be increased, and the nutritive supply decreased, sooner or later retrograde changes must follow, both as regards the function and structure of the kidney. One or both of these conditions, operating either singly or in combination, is the sole cause of all renal affections classed under the generic term Bright's disease.

This assertion does not imply that there is no such condition as an inflammatory process affecting the renal structures, for there is occasionally produced such an intense determination of blood to the renal capillary system, so toxic in its nature and composition, that the vascular structures undergo all the changes common to a true inflammation. When this occurs, the condition classed as an exudative or diffuse nephritis is produced. We now have a true inflammation and it is the only form of renal lesion to which the term *nephritis* should be applied. This form of lesion is rare as compared with all the other forms. Therefore, in a large measure we are justified in the assertion that renal lesions are noninflammatory processes.

The *first* and most common condition that will cause an increased amount of work to be thrown upon the epithelial cells of the kidneys is eating too much, or food of imperfect composition. These errors in dietetics will, at the same time, tend to interfere with the normal nutrition of the renal structures. Overindulgence in the proteid class is more detrimental to these structures than the excessive use of the starches, sugars, and fats, although a deficiency, or too free use of the latter class, may be responsible for the defective utilization of the proteid group and thus tend to act as the etiologic factor in producing the renal lesion.

If more proteid material be absorbed than can be fully utilized, it must be eliminated because the capacity of the blood to hold proteids in solution is a limited one. Hence, the ever charging of the blood with proteids, compels the excretory cells of the hepatic and renal glands to take up these substances from the blood

stream and eliminate them from the system. It may be in the form of an isomer of the proteid which preexisted in the blood stream, or as an oxidation product. If as an oxidation product, it will be of the class called normal or abnormal catabolins. If the oxygenating capacity be sufficiently great, oxidation reduction will occur, and the products will be normal in composition. If not quite equal to the work imposed, the products will be abnormal in composition. If the oxygenating capacity be absolutely defective from any cause, of which there are many, than the excess of albumin contained in the bloodvessels is eliminated from the blood, by the excretory action of the epithelial cells lining the uriniferous tubules; not as serum albumin but as an isomer of that contained in the blood stream.

The latter example is well illustrated by the experiments in which an excessive amount of egg albumen is ingested, following which albumin quickly appears in the urine. Not because the egg albumen is absorbed and discharged as such in the urine; but because there is an overactive digestion with a rapid peptonization of the egg albumen, which, in turn, is followed by the absorption of more peptone than the system has use for. Hence, the surcharging of the blood with albumin, and, to a degree that exceeds the possibilities of the system to reduce the proteids by oxidation. Under these circumstances an isomeric form of albumin appears in the urine as an excretory product of the renal cells—an excretory product, because the albumins are nondiffusible through the bloodvessels. Imperfect oxidation may result from the many conditions that tend to heighten the arterial tension, and augment the speed of the blood through the arterial capillaries, thus interfering with the proper oxygen exchange. The excessive use of the starches, sugars, and fats, owing to the greater ease with which they are oxidized, often exhausts the oxygen supply, thus leaving an insufficient amount with which to accomplish the more difficult task of oxidizing the proteid substances. An opposite condition or a defective supply of the starches, sugars, and fats, may be the cause

of an imperfect oxidation reduction of the proteid, even though the amount of proteid ingested be normal in amount. This is due to the fact that a certain amount of heat energy must be generated over and above that produced by the oxidation of the proteid constituents, to excite reflexly through the nervous mechanism, the innervating forces that are essential for the maintenance of animal life. This heat energy must be supplied by the oxidation utilization of the starches, sugars, and fats. If they are taken in insufficient amounts this alone may be the sole cause of the imperfect oxidative reduction and utilization of the proteid group. This innervating and inhibiting influence, effected through the action of the nervous system not alone upon the functional activity of the kidneys, but in its relation to all the functions of the body, must not be lost sight of as one of the great factors in maintaining a normal standard. It must also be given due consideration in the development of pathologic changes in the animal economy. Hence, it is one of the essential etiologic factors in the development of renal affections of all kidneys. With this explanation, it can be asserted that the transitory presence of imperfect oxidative reduction products in the urine may indicate simply and only that the human organism is being supplied with more albumin than it can utilize. On the other hand, the proteid supply may be normal in amount, but the arterioles and capillaries may be in such a state of high tension that the oxygen is imperfectly distributed. Or, it may be, that too much or too little starch, sugar, and fat is utilized and thus the proteid elements are imperfectly transmuted, or, again the fault may be due to an imperfect condition of the nervous mechanism. Thus we find a very complex problem to contend with and one that must be correctly interpreted in every respect and in full, if the causative factor is to be intelligently and scientifically apprehended and removed.

Viewed in this light it can be asserted that an excess of oxidation products in the urine, and even the presence of albumin in the urine, does not of necessity indicate that the patient has a renal lesion, but it does indicate that one

will follow sooner or later if this abnormal condition be not corrected. Excess of oxidation products, either normal or abnormal, either alone or with the presence of albumin in the urine, should always be regarded as a danger signal, and one to be removed, if possible, before it is too late.

The *second* cause of degenerative changes in the renal epithelial cells is found in the putrefactive fermentation so frequently met in the alimentary canal. This condition results in the formation of toxic products, either formed in the alimentary canal or produced within the system. They may be in their formation either oxidation reduction products or isomeric forms of the proteid elements that are toxic in nature. The latter view is the one that appears to be the most thoroughly in harmony with the laws of chemistry, as those processes are at present enunciated. In either case they are toxic, and have a tendency to destroy the life activity of the protoplasmic structures that are called upon to oxidize, or still further, isomerically, transform these proteid elements into the excretory products found in the urine. As in many instances, they are simply isomeric forms of the proteid molecule or toxalbumins, it becomes a very difficult matter to detect chemically and isolate those which are toxic in their nature from those that are inert, yet in many instances this has been accomplished. In all instances the toxicity of these substances can be determined by physiologic experimentation. With many of these compounds this has already been accomplished; but there are many more to be thus analyzed.

When this condition of putrefaction of the proteids is taking place in the alimentary canal, there is formed a substance named indoxyl potassium sulfate. This substance, by virtue of the entrance of the inorganic substance potash into its composition, obeys the law common to almost all organic substances, and is readily absorbed as such from the alimentary canal, and escapes under its own form from the system through the renal glands, and appears in the urine. When this occurs its presence is easily detected in the urine, and another danger signal

is set in this excretory fluid by which the physician is warned of impending danger to the renal structures.

The *third* and most intense cause of degeneration of the renal cells is the presence of microorganisms acting either directly or indirectly. Directly, when they are acting within the system, upon the proteid structures which go to make up the integral parts of the body; indirectly, when they are acting upon the proteid elements contained in the food products while within the alimentary canal. In either instance they may produce toxic products as already described, oxidation reduction products, or isomeric proteid elements. In one instance they are produced within the system, in the other within the alimentary canal, but outside the body, to be absorbed therefrom into the circulation. In either case the nutrition in general is impaired, and the kidneys are called upon to perform an excessive amount and abnormal kind of work, hence their degeneration. It is further highly probable, if not absolutely proved in all instances, that different kinds of bacteria produce different kinds of toxic substances, either of the oxidation reduction type or of the isomeric proteid form. From the almost uniform absence of oxidation reduction products in the blood and lymph, and their presence in all the excretions of the body, it seems highly probable that they are formed by a process of oxidation in the excretory cells of the glandular organs. From this fact, it is highly probable that the toxic products within the system are more likely to be of the isomeric proteid form, hence the greater difficulty of detecting and isolating them. Some observers, as Adami, of Montreal, go so far as to affirm that all the different forms of renal lesions are the result of the direct action of the bacteria and their products upon the renal structures, and that the bacterial action is entirely within the system. In many instances this is unquestionably true. On the other hand, however, from all the evidence at our command, it is more probable that, in a vast majority of cases, the bacterial action, when it acts as an exciting factor in producing these renal lesions, is brought about in the

alimentary canal, and not within the system. It is the bacteria acting upon the proteid elements of the foodstuffs in the alimentary canal that excites all the putrefactive changes already described, and thus indirectly, and not directly, the bacteria act as the etiologic factors. Insisting, as Adami does, that the bacteria are in all cases the direct and only etiologic factor in producing these renal lesions, seems like carrying the bacteria side a little too far; but when looked upon in the broader sense, and as capable of acting indirectly or secondarily, as already described, then the bacterial explanation will unquestionably account for a very large percentage, if not for all the renal lesions of the parenchymatous type.

Regarding the conditions that interfere with the normal nutrition, it is apparent to the simplest observer that the very conditions that tend to overwork the kidneys tend, at the same time, to interrupt or lower the nutritive activity of the renal glands, and these are the conditions that disturb nutrition. Viewed in this double light, the preventive and direct treatment of these renal lesions is more scientific and practical.

Next to be considered is the development of the interstitial and diffuse forms, and here the etiologic explanation is still more complicated. At the same time it is equally as clear, if the physiologic laws governing the animal economy be closely followed. *First*, the interstitial and diffuse forms are largely dependent upon the three conditions already outlined as causing the parenchymatous changes. In attempting to explain the development of new connective tissue at any point in the body, the vascular as well as the chemical law governing nutrition must always be kept in mind; namely, that all increase or decrease in nutritive activity is always and at all times dependent upon an augmentation or a diminution in the nutritive supply (namely, the blood) brought to the part by its vascular supply. This refers to the quantity as well as the quality. This statement refers chiefly to the ability of the tissue to appropriate to its own use the proteid elements of the blood. If, for any reason, the congestion be carried to a too high degree, a condition border-

ing on stasis is developed; then nutrition is arrested. On the other hand, if the arterial capillaries be too highly contracted, and the blood flows too rapidly through the part, nutrition is decreased or arrested. Thus overexpansion and overcontraction may both arrest nutrition. The latter is more commonly the cause of arrested nutrition and more intense in its action.

In the parenchymatous group of cases, in which the cells enlarge rapidly and tend to compress the intertubular plexus of vessels in the kidneys, there is a decided decrease in the nutritive pabulum distributed, both to the interstitial as well as to the epithelial structures, the same as if the vessels, *per se*, had been unduly contracted. Therefore, as a natural sequence of this compression of the vascular supply, the intertubular connective tissue has a tendency to undergo atrophic changes, although to the casual observer it often appears to be increased in quantity in consequence of an infiltration of the perivascular spaces with an undue amount of water. This edematous condition of the intertubular tissue is produced, as dropsy is, in all parts of body, by the walls of the bloodvessels first losing their nutritive tone and then their function. When this occurs, the capillary bloodvessels discharge the watery constituents of the blood into the perivascular spaces more rapidly than the lymphatics can remove it therefrom. The inherent fibers, however, atrophy, and the perivascular spaces are filled with water, forming a solid edema. When this condition is closely analyzed under the microscope, it is easily apparent to any microscopist that there is no actual increase in the tissues. *Second*, if the retrograde changes in the epithelial cells are more gradual, accompanied by a desquamation of the cells, it may be associated with an opposite condition of the intertubular vascular supply, and in this manner a true development of connective tissue is produced. As first described by Weigert and later confirmed by Cohnheim and C. Wagner, this decrease in pressure upon the plexus of bloodvessels between the tubules causes an expansion of the capillaries, and is followed by an aug-

mentation of the vascular supply, thus distributing more than the normal amount of nutritive pabulum to the intertubular connective tissue. The result of this rapid but progressive desquamation of the epithelial cells ultimately leaves the tubules, as it were, denuded of all of their epithelial cells and the vessels unsupported from the sides. As a natural sequence there results a greatly augmented flow of blood, often altered in composition, through the connective-tissue structures, and this, in turn, is followed by a decided increase in the connective tissue. Of course, there is only a limited number of tubules thus affected at a time, hence this type of lesion is apt to be progressive and to have frequent exacerbations and remissions.

There are other methods by which an augmentation in the vascular supply to the renal glands, and to the intertubular tissue in particular, can be brought about with the development of new connective tissue between the tubules. *Third*, it is quite within the range of possibility that the toxic products in their transit through the walls of the bloodvessels on their way from the blood stream to the protoplasm of the excretory cells, are brought into direct contact with the peripheral nerve endings that govern the contraction and expansion of these capillary vessels. When this occurs some of the toxic products paralyze the nerve-endings distributed to these vessels, and the force of the blood stream from the arterial system causes an overexpansion of the arterial capillaries between the tubules, and a hypernutritive activity ensues with the production of new connective tissue. *Fourth*, similar changes can be brought about by what is known as the reflex action of the nervous system. The toxic products, in passing through from the blood stream to the epithelial cells, are as before brought into contact with the peripheral nerve-endings, but instead of acting as paralyzing agents to the nerve-endings they now act as irritants. This peripheral irritation is carried up to the cerebrospinal centers controlling the vascular system by the centripetal nerves, from which centers, impulses are sent out to the vascular system through the centrifugal nerves, with the final result that the

**TABLE I.**  
**PROFESSOR WILLIAM HENRY PORTER'S**  
**COMPARATIVE TABLE SHOWING CHANGES IN THE URINE WITH THE THIRTEEN DIFFERENT RENAL LESIONS.**

Bright's Disease.	CHEMICAL EXAMINATION.				MICROSCOPIC EXAMINATION.	
	Variety of Renal Lesions.	Color.	Quantity.	Specific Gravity.	Amount of Albumin.	This Refers to Blood and Casts Only.
1. Acute parenchymatous metamorphosis of the kidney.	Abnormally high.	Very small.	High, from 1.017 to 1.030.	Abundant.	Early, hyaline, epithelial, nucleated, and fine granular; small in diameter, and abundant. Later, some coarsely granular and fatty, with large diameter.	
2. Chronic parenchymatous metamorphosis of the kidney.	Abnormally high.	Very small.	High, from 1.015 to 1.030.	Abundant.	Large hyaline, coarsely granular, and fatty casts and large amount of cast-debris.	
3. Parenchymatous metamorphosis of the kidney with pregnancy.	Variable.	Variable but usually small.	Variable.	Variable.	Trace to abundance.	
4. Parenchymatous metamorphosis of the kidney with diabetes mellitus.	Lemon-yellow but later pale.	First large, then small or suppressed.	First high, 1.025 to 1.060; late, low; or at last lower.	At first glucose; later, trace of albumin.	All varieties of casts may be met, even blood-casts from the renal obstruction. Early it will resemble No. 1, later No. 2.	
5. Parenchymatous infiltration—metamorphosis of the kidney with wasting diseases.	Normal or watery.	Normal.	Normal.	None.	None until late in the diabetes, when hyaline and fatty casts appear, occasionally a few granular.	
6. Exudative nephritis.	Pale.	Normal.	Normal.	Early, none. Later abundant.	Examination negative.	
7. Acute diffuse nephritis.	Abnormally high, smoky, or bloody.	Very small or suppressed.	Low, 1.020 to 1.012.	Abundant, also blood.	Early, none, but an abundance of white cells. Later, casts of all kinds.	
8. Chronic diffuse lesion—large kidney.	Peculiar pale.	Constantly varying; sometimes small, then large.	Low, 1.017 to 1.010.	Constantly varying from none to abundance.	Blood and blood-casts a diagnostic feature. Early, small, hyaline, epithelial, nucleated, finely and coarsely granular, in abundance. Later, fatty and larger casts.	
9. Chronic diffuse lesion—small kidney, hyaline thickening of the afferent vessels.	Peculiar pale.	Usually large, 80 to 100 oz. a day.	Low, 1.010 or lower.	Abundant and continuous.	The quantity and variety of casts are constantly varying, at times abundant, and at others absent. The constant fluctuation is diagnostic. All varieties may be found during its course.	
10. Chronic diffuse lesion—small kidney, without vascular thickening.	Peculiar pale.	Always below normal; small.	High, 1.015 to 1.025.	Usually abundant and continuous.	As a rule, no casts are found; but occasionally a hyaline or fatty cast may be detected.	
11. Interstitial lesion or cirrhotic kidney; cirrhotic, sclerotic, or red atrophy; thickening of afferent vessels.	Nearly like water.	Very large.	Low, 1.010 to 1.005.	Usually absent, occasionally a trace.	Hyaline, epithelial, nucleated, finely and coarsely granular, and fatty casts, of all sizes, and in abundance continually. Blood and blood-casts occasionally found.	
12. Gouty kidney.	Nearly like water.	Very large.	Low, 1.010-1.005.	Absent or a trace.	As a rule, a few small hyaline casts, to which are attached minute fat droplets, are occasionally numerous hyaline and fine fatty casts are discovered.	
13. Waxy, amyloid or albuminoid transformation of the kidney.	Nearly like water.	Exceedingly large.	Low, 1.005-1.000, or lower.	Usually marked, occasionally a trace only.	Very long hyaline casts, occasionally leukocytosis.	

arterial system at large contracts; but with a corresponding low tension in the splenic arcade, thus causing a pronounced and continuous dilation of the capillary bloodvessels between the renal tubules. Thus a continuous augmentation of the renal circulation produces progressive formation of new connective tissue. *Fifth*, in still other instances the toxic products act directly upon the cerebrospinal centers that control the vascular system, and in this manner produce very nearly the same vascular changes in the renal circulation with augmented nutrition and the formation of new connective tissue between the tubules. *Sixth*, in still other instances the toxic products produce their peripheral and primary irritation at some remote part of the body so far as the kidneys are concerned, as, for instance, along the line of the alimentary canal. From this point they act reflexly through the central nervous system, with the corresponding low tension in the splenic arcade, followed by augmentation in the vascular and nutritive activity in the kidneys, as already described. All of these methods are in full accord with the wellknown physiologic laws that govern nutrition. They simply augment the physiologic into a pathologic condition. It matters little which one of these explanations is accepted, they one and all tend to bring about the same condition, so far as the vascular supply and production of new connective tissue in the kidneys is concerned. It is unquestionably true, however, that at different times in the same case and in different cases, one and all of these laws come into play in the production of the varied types of renal lesions that are found at the necropsy. It clearly explains the parenchymatous, the interstitial, and the diffuse formations, depending upon which etiologic factor predominates. All these explanations have been made possible, not by clinical observation, but through years of careful research and observation carried on in our physiologic, chemical, and pathologic laboratories. Without this kind of work, medicine would be no further advanced today than it was a quarter of a century ago. So, in the future, all true advances in the science of medicine and

its practical application for the benefit of suffering humanity must come from this same source, hence the great and increasing demand for larger laboratory facilities and workers in this line in all public institutions; until chemistry, physiology, pathology, and clinical therapeutics are brought into close and continuous touch. This fully accomplished, medicine will advance more rapidly than ever before in its history. When chemistry, physiology, and pathology are brought into full relation with the clinical side of medicine, it is perfectly marvelous what can be accomplished. This is especially so in reference to chemistry or that special department classed as chemical pathology.

With this full understanding of the etiologic factors entering into the production of the various forms of renal lesions, their treatment is best considered under two common headings; *first* that of prevention, and *second*, that which is applicable after positive development of the renal lesion. Clearly appreciating this fact, that the parenchymatous group is due to overeating and drinking, to putrefactive changes in the proteids in their passage through the alimentary canal, and to the damaging effects of bacteria and the toxins excited by their presence in the system, we should, as guardians of the public health, continually bring these points to the attention not only of the profession but to the patient. We should impress upon our patients the absolute necessity, both in health as well as in disease, for a simplified regulation of the diet, both as regards quantity and composition. They should be taught to keep the quantity well within the oxygenating capacity of the animal economy, if overwork and a faulty nutrition of the liver and renal glands is to be avoided. They should be instructed as to the necessity for selecting those food substances that are most easily digested and least likely to irritate the alimentary tract, thus preventing in a large measure putrefactive changes of the food as they pass through the alimentary canal. They should be made to understand fully the detrimental effects which follow simple saccharin fermentation. They should be shown clearly

that while the simple fermentation of the saccharin elements alone in the alimentary canal produces very little harm, it does, however, excite marked interstitial irritation. That this is followed in turn by a hypersecretion of a thick tenacious mucus from the interstitial mucous membrane, in place of that which is thin and just sufficient for perfect lubrication. They should be shown that this gelatinous mucus acts as a culture medium for pathogenic bacteria or those that excite putrefaction. In consequence of which there is developed as a natural sequence putrefactive fermentation of the foodstuffs with the production of an almost endless variety of toxins, and that these toxins vary in amount and in the intensity of their poisonous effects. In this manner there is produced a condition which has been classed as an autoinfection, but, which correctly speaking, is an extrinsic and not an intrinsic toxemia. When we are dealing with the contagious or infectious diseases then the bacterial activity may generate the toxin within the system. Under such circumstances we have a true autoinfection or intrinsic toxemia. And insofar as in the management of this class of disease we shorten the duration and decrease the intensity of the process, we safeguard the renal structures against both acute and chronic parenchymatous changes. No matter how or where the toxin is produced, our aim must be to arrest its production, and insofar as we succeed we safeguard the organism from undue damage. In just so far as we succeed in preventing these detrimental conditions, we prevent the possibility of developing all forms of renal lesions. With this understanding of the subject it is impossible to see how operative interference can, in any measure, modify these complex disturbances in the physiologic economy and prevent the development of this class of lesions.

When we come to the prevention of the multiplicity of conditions that influence the circulatory apparatus, and thus cause a modification in the nutritive activity in the intertubular structures of the renal glands, it is by no means as simple an undertaking as is the removal of the conditions that enter into the production of

the parenchymatous forms or renal degeneration. Nevertheless, the removal of all the etiologic factors that enter into the production of the parenchymatous or epithelial group of lesions will, in itself, produce the highest type of nutritive activity throughout the system, and thus materially aid in preventing disturbances in the circulatory mechanism, which will be liable to produce pathologic changes in the intertubular portions of the kidneys. In this manner a more uniform nutritive condition of the whole system is maintained, and the normal integrity of the renal structures, as a whole, both tubular and intertubular, and, in this instance, particularly the latter, is safeguarded against the development of new connective tissue in the intertubular portions, and thus the interstitial forms of renal lesions are prevented. Therefore, that which at first seemed almost impossible to attain has been in a large measure secured.

What has been said in regard to the prevention of the epithelial and interstitial changes singly, applies with equal force to the prevention of the combination of the two when developed together, as occurs in that set of lesions known by the name of a diffuse lesion of the renal structures. The predominance of the two in the same kidney is governed by the kind and amount of the toxic products that are brought to bear upon the renal cells or upon the nervous mechanism that controls the circulatory and nutritive functions of the renal glands. Therefore, it becomes clearly apparent that all forms of renal lesions are dependent, primarily and in a very large measure, upon what the individual eats and drinks. It is further equally as certain that all the toxic elements that act as the exciting factors in determining the different types of kidney lesions, commonly classed as "Bright's" disease, are derived from the imperfect utilization of the proteid elements contained in the food products or in the structures of the body, more probably the former. We should always remember in this connection that both the animal and vegetable kingdoms contain proteid elements in abundance, and so far as is at present known, the one class of proteids is no

more likely, in itself, than is the other, to be isomerically transformed into a toxalbumin, or by a process of oxidation reduction, converted into an abnormal and toxic form. At the same time we should always keep in mind the wellknown fact that the animal proteid exists as a free and single molecule, and is in a condition to be easily acted upon both by the unorganized and the organized ferments. On the other hand, the vegetable proteid is a multiple or many times multiplied molecule, that it is further encased in a more or less hard capsule of cellulose. Both of these conditions interfere greatly with the action, both of the unorganized and the organized ferments. Hence, the well-recognized fact that the animal proteid is easily transformed by the unorganized ferments, and also easily attacked by the organized ferments, while the vegetable proteid is with difficulty transformed by the unorganized and not as likely to be acted upon by the organized ferments. The vegetable proteid often passes through the alimentary tract untransformed, acting simply as an irritant to the mucous membrane. As a natural sequence, the animal proteid is easily digested, yielding a large quota of nutritive pabulum and therefore is a highly economic form. On the other hand the vegetable proteid is difficult of digestion, yields proportionately a small quota of nutritive pabulum, is highly irritating and consequently an expensive form of albumin to use.

While it must be admitted that the animal class is also more prone to undergo putrefactive fermentation than the vegetable, it is also true that the latter is a greater tax upon the digestive powers, which, together with undue irritation produced by the large undigested and irritating residue, tends to excite in a secondary manner more putrefactive fermentation than occurs with a well-regulated diet, composed chiefly of the animal class.

Aside from what we eat and drink, lack of exercise in the open air, sedentary habits, unhygienic surroundings, overwork both mental and physical, and especially the former, must never be lost sight of as factors that enter into the possibilities of a perfect or imperfect digestion, circulation, and utilization of the food

products taken into the system. Therefore, all these conditions must receive due consideration and be corrected, when necessary, if the best utilization of the food elements is to be secured, nutrition normally sustained, and the development of these renal lesions prevented and cured.

When it comes to treatment of the actually existing renal lesions, as evidenced by the profound changes in the oxidation products found in the excretions, particularly in the urine, and which reach their height in the form of albumin, sugar, casts, etc., a still more arduous undertaking confronts the therapist. All that has been said in reference to the prevention of these lesions applies with even greater force to the more difficult task of removing the damage already done to the renal structures, and bringing them to such a nutritive condition that they can again perform their function normally. While it is well known to all that when the renal gland has become decidedly pathologic in its composition, and especially is this so in connection with the intertubular tissue or the interstitial and diffuse forms, it is impossible to restore the organ to its former perfect histologic condition, yet it can in many instances be restored to such an extent that it will, for many years, perform perfectly its full function. These cases viewed with the single eye of the histologist or pathologist, can never be cured. On the other hand, if to this observation there is added the eye of the well-trained physiologist and clinician in the analysis of these cases, and especially that of the well-trained chemicolaboratory worker, the cure of these lesions, physiologically speaking, is known to be both possible and highly probable. It is very essential, however, that the exact existing lesion be recognized early in its development, if even this physiologic cure is to be effected. If it be not discovered until profound changes have been wrought in the epithelial structures or in the intertubular tissue, or in both, the possibility of recovery is reduced to the lowest ebb, but when the lesion is recognized early and suitable treatment is at once instituted, recovery is the rule. This assertion may at first be considered doubtful; but when these cases are

carefully analyzed and treated in the light of the recent advances that have been made in chemiophysiology and therapeutics based thereon, it will be found true.

In treating the fully acquired lesions, out-of-door exercise must be insisted upon with as much precision as the use of medicine. Exercise must not be taken to the extent of producing exhaustion; but in sufficient amounts to increase the oxygenating capacity of the system, so that it will be enabled more perfectly to oxidize and fully utilize the proteid constituents. The clothing must be such that it will prevent undue chilling of the surface of the body from the sudden changes in the atmospheric temperature. In fact, the best results are obtained when the surface of the body is kept in a gentle perspiration at all times. All insanitary surroundings must be removed. Overwork of the muscular and nervous system, and especially the latter, must be avoided. All mental worry, or anything that tends to disturb digestion, is contraindicated, and must be controlled in some manner. The chief and all-important treatment, however, consists in the perfect management of the diet in accord with our advanced knowledge as to its composition and utilization by the system. Here, as in all other diseased conditions, as well as in health, the well-regulated mixed diet is the ideal one to institute.

The recital of a few general principles in relation to diet is essential to a full comprehension of this all-important subject. Four general laws underlie the whole subject. *First*, for the best working of the physiologic economy it is necessary to take a certain amount and quality of the so-called inorganic elements, all of which act simply by their mechanical presence while they are within the system. *Second*, it is necessary to take the requisite amount and quality of simple heat-producing substances, such as starch, sugar, and fat, compounds that are directly oxidized into carbon dioxide and water with the production of heat. The importance of developing the requisite amount of heat energy through a larger utilization of the sugars and fats has often been neglected in the management of this class of cases. Failure to

secure the desired results can often be traced to neglect of this important point, because in the absence of sufficient heat energy the proteid cannot be fully utilized. In some instances a larger utilization of the sugars will be required, in others more of the fats must be used. When the requisite balance is established, decided improvement rapidly ensues.

*Third*, the introduction of the requisite amount and quality of the proteid elements or the true and only tissue-building substances; and *fourth*, there must be supplied to the system the necessary amount of that complex substance in which the iron and phosphorus atom is combined with a proteid, known as nuclealbumin, and out of which the hemoglobin for the blood and the lecithin for the nerve tissue is formed by oxidation reduction.

The milk diet, which has been so long extolled in the dietetic management of all renal affections, is largely deficient in this essential nuclealbumin compound; hence, it cannot be considered an ideal diet in any class of lesions in which a progressive anemia is one of the essential features, and this is known to be the case in connection with all renal lesions. In like manner, meats of all kinds, while they are, like milk, the best of all food substances for supplying an available form of proteid for tissue building, are also deficient in this hemoglobin-forming compound, nuclealbumin; consequently, they are not ideal in their nature. It must always be remembered in this connection that beef proteid is the most easily digested, absorbed, and assimilated of all the known proteids. This is true both of the animal as well as of the vegetable class. Eggs and milk stand next in value in the order enumerated, while the proteids derived from the vegetable classes are the most difficult of all to digest. All the animal class, as well as those enumerated, are defective in the amount of the hemoglobin-forming element, nuclealbumin, but the amount contained in the animal kingdom, like the associated proteid, is much more available than the same substances which are often found more abundantly in the vegetable kingdom.

Turning now to the vegetable kingdom, it,

like the animal class, is found to be abundantly supplied with proteid elements and to contain a superabundance of the hemoglobin-forming element, nuclealbumin, as compared with the animal class. While both the proteid and the nuclealbumin is less available than that found in the opposite kingdom, it can be made to supply readily the deficiency of the animal class. At the same time it must always be remembered that, when resorting to the vegetable kingdom to supply this much needed nuclealbumin, foods are being introduced into the alimentary canal that contain an excess of the starchy and saccharin compounds, and that these hydrocarbon compounds, by virtue of the ease with which they are digested and absorbed, are very apt to overtax an already defective oxygenating capacity of the system and thus add, as it were, fuel to the fire by still further retarding the oxidation of the proteid elements, which even normally are more difficult of reduction. Further than this, many, if not all, substances derived from the vegetable kingdom are irritating to the alimentary canal, and easily undergo saccharin fermentation, while, as we have already found, their contained proteids are very difficult of digestion compared with those derived from the animal kingdom. In fact, the proteids of vegetables often pass through the alimentary canal untransformed into the peptone which is the only isomeric form of proteid molecule, at present known to be taken up from the chyme by the epithelial cells lining the <sup>small</sup> intestinal tract, to be discharged therefrom, in various other forms, into the blood stream, thus forming the various albumin constituents that are found in the blood and tissues of the body.

This being true in health, it is so, to a much higher degree, in diseased conditions. Therefore, we have it conclusively established that neither the animal nor the vegetable class of foodstuffs alone is wholly available in the dietetic management throughout the whole course of this or any other class of disease processes.

This being an established fact, the best results are attainable by the use of a well-regulated mixed diet. A well-regulated mixed diet

is one that is composed of both the vegetable and animal class, but one in which the latter largely predominates. When nature cannot digest such a diet unaided she often can be assisted by the judicious administration of medicinal agents. It requires no little skill, however, to secure just the right balance between the various classes. Neither can any absolute rule be laid down, for each case as a law unto itself. The diet must be adjusted to suit each case and often requires changing from time to time in accordance with the oscillations so frequently observed in this class of diseases.

When, for any reason, the system has degenerated to the point that it cannot be made to utilize a well-regulated mixed diet, the prognosis is bad, and death will ensue sooner or later, all of which is fully demonstrated by clinical experience.

Many observers lay great stress upon the exclusion of the red meats and advocate the use of white meats instead. When this is the case it is quite apparent that the fullest knowledge in relation to the composition of the foodstuffs and the physiology of digestion and the utilization of the different elements contained in the two kingdoms is not brought to bear as it should be upon this all-important question. Of the two, the red meats are to be preferred. The quantity ingested must be regulated, however, with chemical precision.

Careful experimentation upon the human subject has demonstrated conclusively that the proteid of beefsteak or red meat is the most easily digested, assimilated, and oxidized of all the proteids, the loss being only two percent. Eggs rank next, and milk comes third on the list, and so on down through the list of food products until oatmeal is reached, which is the most indigestible of all known substances, for with oatmeal there is a loss of 80 percent, as compared with the amount ingested. It should be further remembered that no matter what the original form of proteid is, it must, in every instance, be reduced from the multiple to the single molecular state, and from this condition be transformed into that isomeric form known as a peptone before it can be taken up by the

epithelial cells. Therefore, when the chemistry of digestion and absorption is under consideration, the investigator has to calculate only with that state of the proteid molecule known as a peptone, because all proteids must be reduced to a peptone before they can be absorbed. So far as it is known to the chemist, it is neither red nor white, but in all instances of the same isomeric form of construction, having lost its former identity in the digestive process. Consequently, the real question at issue is what form of proteid can be most easily transformed into a peptone with the least expenditure of digestive energy. This has been settled in the order before mentioned by the experiments of König, Rubner, Hofmann, Strümpell, Prausnitz, Meyer, Monk, Atwater, Chittenden, Cummins, and others. In the vegetable class, wheat ranks first, but is still considerably behind the animal class.

With the foregoing facts before us, there is no reasonable excuse for using food products that have in their construction a tendency to irritate and overtax an already enfeebled digestion and a system in which the powers of assimilation are at a low ebb. On the contrary, we should use those that are the most easily peptonized and absorbed. It appears to me that the disregard of those fundamental principles resulting from a false interpretation of these facts by many teachers, is the one great reason why so many failures have been recorded in the management of these renal lesions. On the other hand, it explains fully why such phenomenal results are obtained by those who adhere more closely to the known laws of chemistry and physiology that govern the work of the animal economy with such absolute accuracy.

Medication, so called, as formerly used, and as it is still employed in many instances at the present time, simply adds fuel to the fire and absolutely prevents nature from accomplishing what she might otherwise do, and thus prevents recovery. On the other hand, when these chemical laws are fully comprehended and so-called medication applied in full accord with these phenomena and principles, nature is greatly aided in her efforts, not only to prevent the de-

velopment, but in bringing about a physiologic cure of these diseases. The treatment should be directed not so much to the kidneys as toward removing the etiologic factors that enter into the production of these lesions. When this plan is followed, even after the full development of the disease, it will in many instances assist nature to remove the causative factors and, so far as is possible, repair fully the local damage; so much so that the result in a large percent of the cases is almost miraculous in its completeness.

The natural deductions to be drawn from the foregoing study are:

1. All therapeutics, to be scientific, must have for the primary object the removal of the causative factors that are producing the pathologic conditions.

2. There are three general subdivisions of the renal lesions classed as "Bright's."

3. Each of these subdivisions is further subdivisible, both from a pathologic and clinical standpoint.

4. Hemorrhagic nephritis as such does not exist.

5. The so-called hemorrhagic nephritis is an occasional modification of the chronic parenchymatous change.

6. Most renal lesions are noninflammatory processes.

7. Most renal lesions are due to overwork of these glands at a time when the nutrition is impaired.

8. The one exception is in connection with the class known as an exudative or inflammatory process. Here all the phenomenon of a true inflammation exists.

9. There are three well-defined causative factors which enter into the production of the parenchymatous group of lesions.

10. These three factors, plus five others, enter into the production of the interstitial and diffuse group of lesions.

11. Both the overuse and defective supply of the starches, sugars, and fats are important factors to be considered in the production, maintenance, and cure of these renal lesions.

12. Nervous overstrain is an important factor

which often acts indirectly in exciting and maintaining renal affections.

13. Treatment is to be directed both to prevent and to cure.

14. Treatment consists chiefly in the correct apprehension and removal of the causative factors.

15. The successful management of this class of pathologic lesion calls for an extensive and thorough knowledge of chemiopathology and dietetics.

16. Drugs are not in any sense curative; but when rightly used can be made to produce wonderful results by enabling nature to utilize successfully the natural food substances; thus nature can be made both to remove the cause and repair the damages.

17. These renal lesions when studied purely from the histologic standpoint are incurable.

18. Considered from the physiologic and chemical standpoint, a large percent are curable.

19. Viewed from this standard it is difficult to see how surgical interference can, even in a limited degree, be made to remove the underlying factors, hence such measures cannot be classed as scientific.

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## METABOLIC ASPECTS OF OVERFEEDING AND OF UNDERFEEDING.

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In these days, in which we have so much to do with the various disorders arising, directly or indirectly, from the use and abuse of our diet, it seems fitting to ask ourselves whether we are justified in ordering a certain diet in one case and a definite diet in another. It is not my intention, in this paper, to outline what, to my mind, seems the proper dietary in various ailments and diseases with which we are all confronted, but, rather, to discuss, briefly, certain phases of the subject of overfeeding and of underfeeding.

*Normal Standards.*—Before proceeding with such a discussion it is imperative that we fix clearly in mind just what we are to regard as the normal dietary standard for a person in good health and physical condition. At the outset we must remember that certain factors, such as age, sex, occupation, climate, external surroundings, etc., have a great influence in determining the amount of food necessary to maintain one in a condition of healthy equilibrium. Hence, in speaking of a normal standard diet, I will refer, later, to the diet of a healthy adult male doing a moderate amount of work.

As we all know, the standard diet of Carl Voit has long been accepted, more or less generally, as representing the needs of the body under normal conditions of life. He considers that a person of 70-75 kilos weight requires 118 grams of proteid (of which 105 grams must be absorbable), 56 grams of fat, and 500 grams of carbohydrate. This standard of Voit represents, therefore, a calorie value of 3055.6 or 43.65 calories per kilo of body-weight.

The standards of Ranke, Atwater, Schmidt, Gautier, and others are approximately the same, although they differ somewhat in the relations of the different constituents. Von Noorden states that 1.3-1.5 grams of proteid per body-kilo are necessary to maintain the body in nitrogenous equilibrium, while it is immaterial whether the requisite calorie value (35-50 calories per kilo, depending on the amount of work done) is brought up by fat or carbohydrate.

Recently Chittenden, in an elaborate study of the proteid requirements and metabolism of different classes (teachers, professional men, soldiers, and athletes), has shown that nitrogenous equilibrium may be satisfactorily maintained with about one-third to one-half of the proteid standard of Voit. This work is of exceeding importance as it proves, beyond a doubt, that the proteid need, as indicated by the maintenance of nitrogenous equilibrium, is far below our generally followed standard of Voit. As Chittenden's experimental subjects were in excellent condition both physically and mentally after a period of several months on such low proteid diet, it is very apropos to ask: "Is there any real scientific ground for the assumption that the average individual, doing an average amount of work, requires any such quantity of proteid or of total nutrients as the ordinary dietetic standards call for?" While it is true that this lowered standard of Chittenden may maintain the various individuals studied in nitrogenous equilibrium, it does not do so without answering the total calorie need of the individual, as evidenced by the fact that all of the subjects showed a calorie consumption of 30-40 calories per body-kilo. Chittenden says: "It is self-evident that the smallest amount of food that will serve to keep the body in a state of high efficiency, is physiologically the most economic and hence the best adapted for the needs of the organism. Any excess over and above what is really needed is not only uneconomic but may be directly injurious." Although it is doubtless true that the unnecessary overloading of the system with excessive products of proteid metabolism may, in time, weaken the digestive, absorptive, assim-

ative, and excretory functions, yet we are not warranted, it seems to me, in assuming that the life and happiness of a normal being are, necessarily, imperiled by a strict adherence to the Voit standard. As Magnus-Levy puts it, "Is it actually the case that life is constantly endangered, hovering as it is between the Scylla of toxins and the Charybdis of metabolic end-products?"

The question might be asked at this juncture, why do we consider the proteid content of a dietary as so much more important than the fat or carbohydrate values? If these latter constituents are utilized at all, they are oxidized to simple products, which are easily excreted and, hence, cause no undue strain on the assimilative and excretory organs. Of course, before being oxidized, a portion of both of these is stored up in a passive form subject to further orders from the system in general. I have, naturally, no reference, here, to the effect of an excessive fat or carbohydrate diet, which is a factor in the production of obesity or of diabetes.

With the proteids, however, a somewhat different course of events is observed. To be utilized by the system proteid must be built up into its constituent protoplasm. We are all familiar with the differentiation of proteid as organized or unorganized, stable or labile, tissue or reserve, etc. It is unnecessary for me to do more than call attention to the conception of "reserve proteid" as being entirely analogous to reserve fat or carbohydrate. The proteids, on oxidation, are split up into various nitrogenous products, some of which may exert, if present in sufficient quantity or if acting over long periods of time, untoward effects preceding and during their excretion. These metabolic end-products, or toxins as they have been styled, may cause some specific or local disturbance, which calls for their speedy removal. In the elimination of such products through the kidneys, definite lesions or at least functional insufficiency may arise. Moreover, the other organs of the body, which have to do with the further elaboration of these products, may suffer functional impairment in their attempt to keep pace with the excessive supply of elaborative

material. Our knowledge regarding the formation and excretion of these nitrogenous end-products is too meager to permit us to say whether increased formation is accompanied by increased excretion of each product or whether, on a diet rich in proteids, these substances are retained to a greater extent than on a diet such as is advocated by Chittenden. On the solution of this point depends, it seems to me, the decision whether the Voit standard is a dangerous one. Naturally the excretion of an increased amount of these end-products might influence the excretory organs, but it remains to be proved whether the kidney, in health, is or is not capable of excreting the products of metabolism of the proteid standard of Voit, without suffering undue strain.

Folin, in his careful work on proteid utilization, through which he was lead to formulate his "Theory of Proteid Metabolism," comes to the conclusion that our proteid dietary is much too high. His figures agree fairly well with those of Chittenden and are based on determinations of the exogenous and endogenous nitrogen. His work shows us how futile it is to draw conclusions regarding the nitrogenous metabolism from the amount of urea excreted. Of much greater importance is the nitrogen partition and, particularly, the amount of creatinin excreted in 24 hours, inasmuch as this nitrogenous constituent is the one nitrogen factor uninfluenced by a variation in the meat-free proteid diet.

It would seem, therefore, that we must accept the possibility that our proteid intake may be diminished to one-third to one-half of the Voit standard without causing any disturbance of the nitrogenous equilibrium or of the general health and physical activity. However, I am inclined to believe, without having definite experimental grounds for my belief, that a diet, which keeps strictly within the prescribed standard of Voit, will work no lasting ill-effect, unless the system be undermined by disease, which is not traceable to errors of diet and in which no sensible physician would order a dietary high in proteid until the period of convalescence had been definitely established. It is most certainly true that a

moderate diminution of proteid is less harmful, providing the total diet be sufficient, than is an abundant proteid diet with a calorie deficit (von Noorden).

Accepting, then, that the average diet of a normal individual should contain from 30-50 calories per body-kilo and that the proteid content of the dietary should run between three-fourth and one and one-half grams of proteid per kilo, we come to the discussion of the subject of our paper.

*Overfeeding.*—By the term overfeeding or forced-feeding we mean the giving of an amount of food which furnishes the body more energy than it needs, utterly regardless of whether the addition be in the form of proteid, carbohydrate, or fat (von Noorden).

The errors in diet, which most of us, unfortunately, commit, are productive, on the one hand, of various disorders as a result of the overtaxing of the digestive, absorptive, assimilative, or excretory organs with excessive products of metabolic activity, and, on the other, of a series of peculiar derangements, pointing to a condition of undernutrition. I need only refer to the obese, diabetic, and gouty subject on the one side, and the neurasthenic, neuralgic, and chlorotic patient on the other. I shall, therefore, in this paper, treat of the subject of overfeeding only as a therapeutic measure and not as an etiologic factor in disease.

It has been shown by Rubner, Magnus-Levy and others, that addition of an excess of food, in the form of fat or carbohydrate, exerts, even when given in large amounts, only a slight increase in the energy relations of the system. This, of course, applies to an immediate increase in the oxidative processes and not to the later effects of the reserve fat or carbohydrate. Only a part of such excess is burned up in the system, the chief part being stored in the various depositories subject to the checking orders of the system. On addition of fat to the diet, almost the total excess of energy is turned to the advantage of the body, not in the form of increased energy, but, rather, in the form of latent energy as a deposition of fat. Zuntz has proved, that of 100 grams of fat increase in the diet,

97-98 grams were stored up. With the carbohydrates the relations are not quite so high. A loss of 10 percent, according to Zuntz, is observed in the total energy available from an increase to carbohydrate. Moreover, the conversion of the carbohydrates into fat is accompanied by some loss of heat.

An increase of proteid in the diet raises, on the contrary, the general tissue metabolism, as evidenced by the increased oxidation, far above the normal standards and far above that which could be traced to the activity of the bowel. This primary increase in the oxidative processes, which is effected by a meal rich in proteids, lasts for 8-10 hours. This fact may be expressed more briefly in the statement that, every addition of proteid increases the proteid decomposition, the system soon adapting itself to a new equilibrium. Right here it may be well to point out that it is erroneous to refer every loss of nitrogen to an increased decomposition of body-proteid. There is no reason for supposing that tissue-proteid is decomposed in any different way than is food-proteid. Likewise we are not justified in assuming that the products of tissue-metabolism are, normally, or abnormally, any different from those of food-metabolism under the same conditions. The point of all this is, that the increased nitrogen excretion observed under certain conditions may be referable to the proteids of the food and not to those of the tissues.

*Proteid Sparing.*—We all know that every addition of proteid to a normal diet yields a nitrogen retention for a few days and that the nitrogenous equilibrium is, under these conditions, pitched to a higher scale as long as this increase lasts. Under a normal diet the proteid of the food is completely decomposed, the output equaling the intake. If the diet contains a normal amount of proteid but is increased by the addition of N-free constituents, a certain amount of N is retained in the body. This is the wellknown point of proteid sparing and seems to be an exception to the law that the body under all circumstances seizes, in the first place, upon the easily available proteids. If, however, we make an application of Guldberg-

Waage's Law of Mass-Action, we see that the mass of a substance may be so great as to overbalance the greater affinity of a substance present in less quantity.

It has been shown that a large excess of fat and carbohydrate is necessary to protect small amounts of proteid from being oxidized in the system. If we withdraw large amounts of carbohydrate from the diet, the proteid decomposition increases, while the withdrawal of fat does not cause such a marked disturbance in the proteid metabolism. I mean by this that the nitrogenous equilibrium is better maintained by excess of carbohydrates than by fats, or, in other words, sugar is a better "sparer" of proteid than is fat. This point is of great importance in the treatment of the obese.

The fact that the body endeavors to regulate its proteid decomposition according to the intake and, hence, to oxidize the largest possible percentage of the proteid of the food, suffers exceptions in youth, pregnancy, convalescence, etc., inasmuch as growth and development of tissue would be impossible without a definite change in the nitrogenous relations.

*Flesh and Fat.*—It would seem then, that we have two ordinary forms of overfeeding, the one leading to increased fat formation and deposition and the other to increased deposition of proteid. It is not an uncommon thing to find in our literature flesh and fat used as synonymous terms, but it seems needless for me, in this place, to point out the distinction between them.

It is self-evident that we may increase the fatty condition of the body regardless of the proportions of the food in a course of forced feeding. Theoretically there is no limit to the extent of this fat deposition, but practically it is limited by failing intestinal activity and disease of the vital organs. Naturally, however, one seeks, in instituting such a course, only the certain optimum nutrition. The rest-cures of Weir Mitchell, which consist of forced feeding along with massage and light exercise, tend to produce fatter but not stronger and more fleshy patients. In other words the forced feeding works here as in the case of the Strass-

burg goose and not as in the case of the athlete. Muscular exercise, along with forced feeding, gives far better results than the rest methods. Zuntz reports a case in which systematic muscular exercise for many days and weeks, along with forced feeding, caused loss of weight but a simultaneous deposition of proteid, the calorie consumption being greater at the end of the research than at the beginning. This experiment is confirmed by the every-day experience of our athletes.

*Increased Calorie Consumption.*—The increased calorie consumption, as a result of forced feeding, rests upon two different factors (von Noorden).

1. The increase of decomposing protoplasm: Although definite relations exist between consumption of energy and body-mass as well as amount of surface, the amount of active decomposing protoplasm is of great importance in regulating the consumption of energy. The body-mass (weight) is important in average nutritive conditions only insofar as we may assume that a certain unit of weight of protoplasm corresponds to a certain unit of body-mass. If fat is added by overfeeding, the body accumulates a weight-increasing substance, which shares very little in the energy relations of the body. As a result of this loading with ballast the conversion of energy, calculated to unit of weight, sinks under forced feeding, as is instanced by the smaller energy equivalent per kilo of the obese. No definite quantitative relations have been established between increase of protoplasm and increase in consumption of energy but such relations must exist.

2. Increase of body-mass, independent of the increase of protoplasm: It is evident that the heavier the body-mass, the more energy is needed to move or raise it. Hence, we observe the increase of work upon the muscular system, heart, and respiratory apparatus of the obese. As mentioned before, an increase of fat cannot aid in the oxidative processes through the influence of the fat itself but only through the weight-increasing influence of this otherwise useless substance. We all admit the value of a certain amount of fat as a reserve to meet the demands forced on

the body by overwork or by disease, but few of us would be rash enough, I believe, to proclaim the advantages of the excess fat in the obese.

It is well to remember that the excess of food is not so important for the maintenance of the high nutritive condition as is the vital property of the protoplasm. We are, therefore, forced to admit that the ordinary forced feeding, which leads to a deposition of fat and hence does not increase the direct energy equivalents of the system, is not the best practice.

*Increase of Nitrogen.*—Von Noorden, Fr. Müller, Svenson, and others have shown that the human organism is not, under all conditions, disposed to N-deposition. However, when an increase of N does take place in the system it may do so in several forms:

1. As extractives. 2. As proteid: (a) Organized proteid; (b) unorganized proteid, labile proteid, reserve proteid, etc.

If the increase of nitrogen in the system has taken place in the form of extractives, we may have either an increased formation or a diminished excretion of these substances. It is not my purpose to discuss the importance of these factors as etiologic units in diseases, that would draw me too far from my theme. However, I must mention the facts that we have, in disease, both a primary retention and a primary formation of increased amounts of these substances as evidences of diseased conditions in the body.

The fact of the nonutilization of the unorganized or of the reserve proteid under normal conditions, has been previously mentioned. There may be a retention of nitrogen, but this does not, necessarily, mean an increase in the organized proteid. An increase of flesh in adult animals means an increase of volume, a hypertrophy of the individual cells but not an increase in their number (Magnus-Levy). Thus we see the increased muscular development under forced feeding along with muscular exercise.

Although we have learned from research several methods of increasing the proteid of the body, we have little information as to how far the forced feeding may go and what happens

to the deposited proteid if the subject returns to his normal diet. It has been generally found that the retained proteid is lost under such circumstances. This makes it clear why the forced training and feeding of athletes is apt to result disastrously unless the same procedures, perhaps in a lesser degree, are kept up after the periods of active training. Too common are the uncompensated hearts and the emphysematous lungs to need mention. While such changes are largely due to the strain of the training, the diet must be held partly responsible, inasmuch as the increased size of the organs and the hypertrophy of the individual cells is a result of the increased nutrition as well as of the increased work. Drop both and the condition is evident.

The question arises as to whether the deposited nitrogen is new capital with the same biologic properties as the old. We must consider, in this connection, that not all of the nitrogen intake is converted into tissue proteid to compensate for the nitrogen output. It is certainly the case that, in the consideration of nitrogenous equilibrium, we usually regard the nitrogen output as equaling the intake. We, unfortunately, do not know just how much of this nitrogen intake is built up into true tissue-proteid nor how much of the nitrogen output is derived from decomposing tissue-proteid. Before the unorganized proteid or the retained extractive nitrogen can be utilized it must be converted into tissue-proteid, as this is the form capable of oxidation. There is no reason for supposing that tissue-proteid, under the influence of the constantly occurring autolytic changes, splits any differently than does food-proteid, and hence we must consider the possibility of a synthesis of tissue-proteid both from the cleavage products of food-proteid and from those of the autolysis of the tissue-proteids themselves. If the latter assumption be correct we must ask the question, may the tissue-proteids be renewed by the autolysis and later synthesis from its own autolytic products? Such a change might seem useless, but when we consider that the wear and tear of the system necessitates the constant breaking down of tissue-proteid and its

renewal by new synthetic products, the possibility does not seem so far-fetched. Were the tissue-proteids not constantly renewed the subject of nitrogenous equilibrium would be much simplified, as the output would consist, largely, of the metabolized and excreted intake rather than of the autolytic and retrograde products of tissue metabolism.

Time will not permit me to enter upon a discussion of the various ways of synthesizing proteids and so I can do no more than refer to the importance of the study of the work of Fischer upon the polypeptids. This work bids fair to unravel much of the mystery surrounding the chemical and "vital" activities of the "Awesome proteids."

How is it possible to decide whether a retention of nitrogen in the system means a gain in tissue or of reserve proteid? I quote from von Noorden.

1. If a deposition of N means proteid deposition, sulfur must also be retained.
2. If S-containing proteid, but no mineral constituents are retained, then the blood and lymph tissues come into consideration as the place of retention. In this case the deposition of proteid is in the reserve form.
3. If proteid and mineral constituents are retained, then the proteid is built up into the constituent protoplasm of the system. A relatively large phosphorus retention is, as is well known, intimately connected with an increase of nuclear substance.

*Indications for Forced-feeding.*—Forced proteid feeding is indicated in growing children, in pregnant and nursing women, in persons accustomed to increased work, in those who are undernourished as a result of chronic conditions such as carcinoma, tuberculosis, stomach diseases, etc., and in those convalescing from acute febrile conditions. In this latter group of cases the results to be obtained are far better than those observed when the inanition is due to chronic diseases.

*Underfeeding.*—It has been well said that he who does not know how to estimate in how far the changes, which he observes at the sick bed, are dependent on simple inanition, cannot

rightly interpret the metabolic changes which arise from the disease itself.

Under this caption I will, varying from the method adopted in the discussion of overfeeding, refer more to the effects of a long-continued underfeeding upon the system than to any therapeutic application, inasmuch as we can conceive of no case in which the adoption of a course of underfeeding would be advisable other than in the obese and in those who are chronically overfed.

By underfeeding we mean the giving of a diet insufficient in calorie value to meet the needs of the organism. Naturally we may have an underfeeding with one constituent and a relative overfeeding with another and yet the calorie value be insufficient.

It is self-evident to us all, that a definite relationship between proteid, carbohydrate, and fat is consistent with the best nutritive condition of the system. Granting that a normal individual needs a definite number of calories to satisfy the demands of the system, we must endeavor to supply this need by a proper combination of constituent dietary principles. An exclusive and excessive meat diet with insufficient calorie value (and a sufficient calorie value would be reached with difficulty in this way) will just as surely lead to undernutrition as will a general calorie reduction with relative decrease in all the constituents of the diet. A high addition of proteid, if unprotected by a sufficient amount of N-free food, is unable to maintain the nitrogenous equilibrium, because the energy required for the preservation of the body functions must, in this case, come from increased proteid change. Hence we should recognize as a law that caloric undernourishment, with high proteid content, cannot protect the system against loss of body-proteid.

It is true that, at present, undernourishment or underfeeding is usually referred to a lack of nitrogenous substances in the diet. Yet we must remember that the fats and carbohydrates, if reduced to a marked extent, will not only lead to a loss of proteid but will necessitate an increase of nitrogenous substances in the diet in order that the requisite calorie value be

maintained. In this way we might conceive of the paradoxical condition of a one-sided overfeeding combined with general underfeeding. Of course the metabolic results would here be very different from those of an overfeeding previously discussed, because, technically, we have no increase of calories and consequently no overfeeding.

General underfeeding leads to a loss of glycogen, fat, and both organized and unorganized proteid. Without sufficient calorie value of the food and, in general, without a definite relationship of the constituent parts of the dietary, the system can take little or no advantage of the diet, but, rather, uses up its own store of these constituents to furnish the energy required. We can readily see, therefore, why long-continued underfeeding leads to gradual weakness and impairment of functional activity throughout the system. A certain amount of fat deposit is, as stated before, a protection against greater N-loss on an insufficient diet. Thus, in the obese a calorie deficit does not always lead to N-loss, at any rate more seldom and in less degree than in the spare.

The following general effects of a long-continued underfeeding are to be recognized (von Noorden).

1. The proteid decomposition sinks, up to a certain point, beyond which further decomposition is serious. The body, at this point, adapts itself to a fairly permanent equilibrium, as is shown by the fact that not so much body-proteid is lost in the later periods as in the beginning. Nitrogenous equilibrium can be maintained, as Voit, Rumpf, Siven, and others have shown, on a lower proteid addition than is customary, provided the calorie need is covered. I recall, in this connection, the maintenance of nitrogenous equilibrium by Chittenden with a much lowered proteid diet but with sufficient calorie value to prevent any undernutrition, the subjects showing slight gain in strength and physiologic activity rather than a loss.

2. Long-continued underfeeding, aside from very slight degrees of calorie deficit, leads to constant loss, not only of body-fat, but also of body-proteid, immaterial whether the proteid

intake be large or small. The absolute height of the N-excretion depends on the amount of proteid but the maintenance of nitrogenous equilibrium is independent of the amount, as a balance is established to suit the intake. A calorie-poor diet, which is rich in proteid, may protect the N-loss or may even raise it for a time, but the final result will be the same as if all parts of the diet were simultaneously reduced.

3. Whenever the addition of food lessens the calorie deficit, a building up of cell material takes place, although the calorie need, at this time, may not be completely satisfied. This condition lasts until the body is accustomed to the new equilibrium, when N-loss begins anew unless the calorie need is absolutely covered.

I will reserve for a later paper the discussion of the changes occurring in the secretions and excretions of the body in underfeeding and in overfeeding, inasmuch as a discussion of these factors would alone consume my time. I would, however, interpose a word of caution concerning the referring of every variation in the output of nitrogenous constituents to an abnormal tissue-proteid metabolism. We must, today, lay more stress upon the nitrogen partition than upon the determination of any one nitrogenous constituent and, moreover, it seems to me, the time is almost ripe for a more detailed investigation of the excretion of the amido-acids in underfeeding, overfeeding, and in various diseases. If a former contention of mine be substantiated, that a variation in the chemical properties of albumins may be shown by the quantitative examination for various amido-acids, then we may have more light thrown upon the nitrogenous exchange of the system.

It can only be self-evident that the metabolic changes arising from over and underfeeding are in part traceable to direct tissue decomposition and in part to normal and abnormal decomposition of food. Without a knowledge of such changes, we cannot judge of the specific changes of a concomitant disease.

#### CONCLUSION.

In these remarks I have not attempted to bring out any new facts, but have tried, solely,

to present what we know regarding some phases of the metabolism in the conditions under discussion. Criticism may be advanced against some of the statements herein contained, but as they are all based upon experimental data, we must, at any rate, give them our earnest consideration. That many conditions, now recognized as obscure, may soon be traceable to simple over or underfeeding, is probable, and it is the object of this paper to present certain facts, which may enable us to refer such conditions to their proper nosologic position. A more thorough study of many points not yet clearly defined will permit us to understand more clearly with what we are dealing and how it may be corrected. My plea is, merely, for a more scientific and more intelligent recognition of the advantages and disadvantages of a dietary in bringing about a more normal condition of our patients, whether they be racked with disease or whether they be suffering with malnutrition, excessive or deficient.

### AN EXPERIENCE TENDING TO EMPHASIZE THE NECESSITY FOR ROUTINE EXAM- INATION OF THE EARDRUMS OF CHILDREN WITH FEVER.<sup>1</sup>

BY

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Both McKernon and Kerley have in recent publications made the statement that "no examination of a sick child is complete until a thorough inspection is made of the condition of the middle ears." Possibly others have made this same assertion, and emphasized it; but conditions are such that we should keep hammering at the subject until there is a more general recognition of the truth of their contention.

This statement carries with it this fact: all of us who are general practitioners, or who practise as pediatricists, must include in our pocket outfit a headmirror and a set of ear speculums, just as we carry a stethoscope, hypodermic needle, and thermometer. The time has passed when we can allow a case of "pneumonia" to "resolve"

<sup>1</sup> Read before the West End Medical Society, New York, May 26, 1906.

when the eardrum ruptures. Neither have we a right to consider, without distinct pathologic findings, that a majority of cases of fevers are either malaria, typhoid, or chronic grip. And it is equally positive that we will not make these errors if we systematically examine the eardrums of our little patients. "Confession is good for the soul," and I admit that I have attended in years past more than one case that I thought was a central pneumonia, but in which resolution occurred coincidentally with a discharge from one or both ears. I also know that I have had an ear begin to discharge when I suspected no inflammation, and while I was treating the patient for malaria or grip. Whether any of my cases of meningitis have been primarily middle-ear abscesses, no one will ever know.

The cause of our neglect in this matter is the bred-in-the-bone idea that there can be no acute inflammation of the middle ear unless there is *pain*, and that the child must either cry severely, or tug at the affected ear. To quote a rather inelegant, but at the same time forceful remark of an authority on this subject: "In a large majority of these cases of acute suppurative otitis media we might as well expect hell to freeze over as look for *pain*, as evidenced by crying, or pulling at the ear." If this statement is correct, what, then, is our duty to our little patients who are brought before us with a history of fever? Every one of them should have the eardrums examined with the same regularity as the heart, lungs, tongue, and throat. Moreover, this routine examination of *all* ears will make us so conversant with the appearance of the normal that we shall easily recognize the pathologic.

My title refers to an "experience." From December 10, 1905, to May 10, 1906, a period of four months, in my private work, 26 patients had acute suppurative inflammation of 37 middle-ear cavities. Two of the 26 patients were adults, and both had severe pain. Of the remaining 24, four only had their ears examined because of pain. The ages of these four were five, seven, and two of eight years. The remaining 20 children had their ears examined only as a routine measure; the history in each

case being simply "the child had fever," with no reference to pain or discomfort. There may have been a certain amount of restlessness, but no more than we might expect as the result of a high fever. The ages of the 20 patients ranged from five months to eight years. Eleven were under one year, and five were between one and two years. All of the 37 ears were operated upon, 16 by Dr. McKernon; and all but two ears discharged pus. Regarding these two I will speak later. But one case extended to the mastoid. The ears of all were douched every three or four hours with a 1-8000 solution of mercuric chlorid; and all but the mastoid case were healed in less than three weeks—most of them in less than two weeks.

In the case that developed a mastoiditis, the eardrum was incised by Dr. McKernon but a few hours after it was known that the patient had fever, on April 5. Three days later the temperature was normal for the whole 24 hours. After two days without fever, suddenly, on April 11, the temperature rose to 103°, and there was an equally sudden decline to normal. From this time to April 14, the temperature ranged from normal to 103°-105°, with two exacerbations a day. During this time there was no pain, no external swelling, no evidence in the canal of an extension of the trouble from the middle ear. And furthermore, on April 14, the day of the operation by Dr. McKernon, when the mastoid was found filled with pus, Dr. Sondern reported on an examination of the blood "a very moderate leukocytosis, *without* polynuclear increase." The patient is now practically well.

Two cases with both ears involved followed pneumonia; and one case followed seven weeks after an attack of lobar pneumonia, and occurred practically in connection with a second attack of pneumonia. These three cases presented many interesting possibilities, of which I wish to speak briefly.

CASE I.—Boy, aged 4, family history negative. No previous illness. His pneumonia involved the left lower lobe, and there was a very high temperature (104°-106°) for seven days, when resolution occurred by crisis. The tem-

perature remained absolutely normal for nine days, when on the tenth afternoon it rose to  $101^{\circ}$ , and went down to normal the next morning, when the child felt perfectly well. On the eleventh and twelfth afternoons the temperature was  $101.4^{\circ}$ , but normal each morning. The chest was examined for evidences of fluid, and the ears were examined. Both ears were slightly off from the normal. Two days later the maximum temperature had reached  $102.6^{\circ}$ , and a consultation was held, with the result that it was thought probable that an empyema was developing in the chest, though it was not considered prudent to use a needle as yet. The next two days were a repetition of the past; normal temperature each morning, with the child bright and entirely free from all discomfort, and in the afternoon heavy and feverish. The temperature had now reached  $103.6^{\circ}$ . The eardrums were more congested, but not bulging. Another consultation was held, and it was decided to open the eardrums, which I did. A small amount of thin fluid escaped from each ear, but at no time was there any visible pus. The next day after operation the maximum temperature was  $100.6^{\circ}$ , rectal, and after that it remained entirely normal. These ears were examined only as a routine measure. What might have occurred had we not examined them?

CASE II.—Boy, aged 2½. Family history negative; general condition fair. Pneumonia of right middle lobe. Temperature normal on the eighth day, and remained normal for seven days, when there was a sudden rise to  $104^{\circ}$ . There was absolutely nothing about the child that referred the trouble to the ears. Inspection showed the right eardrum bulging and a slight congestion of the left. Paracentesis was done on the right drum, and pus discharged freely. The temperature went up equally high the next day, and the left drum was incised. This ended the fever, and there was prompt convalescence. Suppose these ears had not been inspected, what were the possibilities hanging over the child? Mastoid abscess, sinus thrombosis, meningitis and other equally critical conditions. We, in the meantime, would be looking for pyemia, abscess of the lungs, malaria or typhoid.

CASE III.—Girl, aged 8; robust child; had lobar pneumonia at Christmas time. I saw her first in my office on the evening of the last day she had any rise of temperature, when it was  $102.4^{\circ}$ . She had consolidation of the left lower lobe. The consolidation disappeared, and in two weeks she was back at school. She acted as though perfectly well, and ate well;

but her color was not as good as usual. Apparently she had no fever, though her temperature was not taken. On February 12, she was knocked off her sled and struck in the abdomen, hurting her severely. On February 13 and 14, she was at school, well as usual. On the afternoon of February 14, she suddenly became very feverish, mouth temperature being  $104^{\circ}$ . I examined her carefully, and until I looked in her ears found nothing to explain her fever. One eardrum was intensely congested and bulging. Dr. McKernon was called, and under chloroform the membrane was incised, very thick pus being found. The next day the temperature had not subsided, and she was complaining of severe pain in her right iliac region. There was much tenderness and rigidity, she had vomited several times, and she had the facies of peritonitis. At this same time there was diminished respiration over the right upper chest, but not sufficient to warrant a diagnosis of pneumonia. Dr. Dowd saw her, and advised her removal to the hospital for inspection. The next day, February 15, she had a well-developed pneumonia, with abdominal symptoms slightly diminished. After a week of critical illness, during which time there was a profuse discharge of pus from the incised ear, she recovered. What might the story have been had the abscess in the ear not been opened?

Here I would remark that adults as well as children, in connection with pneumonia and typhoid, frequently develop, without pain, middle-ear trouble. How often will this condition explain our typhoid malaria, or malaria with pneumonia? Certainly we should keep the possibility constantly in mind.

None of my cases occurred in connection with scarlet fever, measles, or diphtheria, and less than half the number had any appreciable sore throat. Had these conditions prevailed I might have expected still more frequent involvement of the ears.

The streptococcus is by far the most frequent cause of the inflammation. The staphylococcus, pneumococcus, and *Diplococcus intracellularis* of Weichselbaum are also causative factors, and in point of frequency occur in the order named. A mixed infection, including the streptococcus, staphylococcus, and pneumococcus is frequently found.

The type of fever in these cases is the intermit-

tent or septic variety; a pure streptococcus infection causing the higher fever, and one showing the most rapid changes in temperature. Certain types of the staphylococcus, though, may be as virulent as the streptococcus.

There seems to be a decided selection of the younger patients as victims for attack. Of my 26 cases 16 patients were under two years. Out of a series of 51 cases reported by Kerley in 1904, 31 patients were under two years. As a large majority of my patients, 18 of the 26, were in good general condition when taken sick, it would seem that we must look for some other cause for susceptibility than lowered vitality. Dr. McKernon tells me that three-quarters of the length of the eustachian tube in the young child is cartilaginous, one-quarter only being cartilage in the adult; and that it is relatively much larger and more patulous than in the older child or the adult. This, to my mind, offers us at least a partial explanation, not only of the increased susceptibility to otitis, but of the relative absence of pain in the younger children.

The season of the year has a marked influence as regards susceptibility to attack. Of the 37 ears involved, 28 were afflicted during February, March, and April, amounting to almost an epidemic condition. Certainly there were more cases of this trouble than of any other one serious condition I saw during the period.

While at times these cases are practically epidemic, the sporadic cases are occurring at all times of the year, and may occur in connection with any disease; and, to revert to my previous quotation, "no examination of a sick child is complete without an inspection of the eardrums." This applies to *each examination* of the patient, if there is any great variation in the temperature chart. Today we may find one eardrum bulging, the other normal; tomorrow, the other markedly affected. In fact, McKernon states that four or six hours many times have changed a normal eardrum to one markedly bulging.

When an eardrum shows evidence of inflammation, the membrane more or less reddened instead of pearly, the "light spot" obliterated or markedly exaggerated from clear fluid

behind, more or less bulging of the drum, with obliteration of the lines of the malleus, there is but one safe procedure; and this consists in making a free opening. I am aware that many prefer to temporize for a time, using douches, counterirritation, leeches, unguentum Credé, etc.; but it seems to me that this, like appendicitis, is a purely surgical condition, and the more promptly the abscess is opened by a simple incision, the less liable are we to have an extension of the inflammation to adjoining parts, when very serious and extensive surgical measures may be required.

## THE MODERN DEVELOPMENT OF PHYSICAL HEALING METHODS.<sup>1</sup>

BY

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At the beginning of the present century articles were published in a great many newspapers, medical papers not excepted, pointing with great pride to the marked progress humanity made during the past seculum and we read that never before has such great progress been made as during the last decades.

To a certain extent this is true, but a glance at the history of our art will show that we ought not to be too boastful in this direction. History shows us that very often things, which have appeared as truisms, proved to be false a short time afterward. Nevertheless, we are fully justified in claiming that in our time medical art has made some progress equal, if not superior, to the most important achievements of bygone ages. Two instances may be mentioned. Bacteriology with its application to etiology, diagnosis, and treatment of disease, and second, the modern development of physical healing methods, are results of which we ought to be proud. I would like especially to direct attention to the physical healing methods which have produced entirely new views and furnished new methods in the practice of medicine and in the policy of the profession. They are as old as medical science itself, but it was reserved for

<sup>1</sup> Paper read before the Milwaukee Medical Society.

our time to investigate them scientifically and to furnish the foundation for their systematic and useful application. I think nobody will accuse me of exaggeration when I claim that by these means the possibility of removing and relieving human sufferings and ailments is greatly increased. The first question which then offers itself is: How was it possible that these methods were not appreciated by the profession in former times? Because in the first place it is much easier to write a prescription for a patient than to devise and carry out a plan of treatment by means of physical healing factors. And, it so happened that laymen, speculating upon human suffering for egotistic reasons, took up this mode of treatment, as it is easily accessible and easily learned. This was made easier for them, since legislation, so far as it protects the medical profession and makes the practice of medicine dependent upon a license acquired by examination, does not exact the same conditions for the practice of physical healing methods. In consequence through such quacks, earnest scholars became too disheartened to work in this sphere, particularly since physicians, who from low motives desired to be in opposition to legitimate medicine, used them in preference. It was possible, however, to remove this ban when scholars of the highest scientific and professional standing as Winternitz, Leyden, Goldscheider, Ziemssen, Bier and many others investigated and called into life scientific fundamentals in place of the former rude and empiric application of electrotherapy, hydrotherapy, dietotherapy, light therapy, massage, and gymnastics. This gives us the assurance that the present knowledge never will be lost but is placed upon a solid foundation and forever removed from the narrowness of former times, which confined itself to the routine practice of one or the other of the physical methods.

Second, the rapid advance in technical and natural science in our days was necessary to enable us to introduce a part of these methods into practice. I will mention a few points only; the manufacturing of small dynamos enabling us to make better use of the electric current, to transform it into power and so to apply it for

the good of our patients. Also through the ingenious discovery of the röntgen and Finsen rays a new era in light therapy not less effective and useful was inaugurated. High-frequency currents and magnetic fields are now also at our disposal for cures.

As with all successful remedies, the mistake was made of exaggerating the success and of applying them in unsuitable cases as well as in suitable ones, using them in cases in which favorable influences could not be expected. The natural consequence was that through this overzeal many physicians became distrustful. A marked change thus took place; true medical scientists became more critical and cautious in their conclusions. The "*in verba magistri jurare*" so fatal to the salutary and successful development of science, the blind belief in authorities, which for centuries has checked the knowledge of nature lost their influence. Even the theories of Winternitz, the father of scientific hydrotherapy, who devoted an earnest and successful life to this branch of medicine, have been subjected to sound criticisms but not to the detriment of the cause. To this modern critical judgment of the profession, we owe many of the achievements of our time, a solid and scientific and we may hope an everlasting foundation at least in the principles. A further advance was made when we began to be conscious that treatment with drugs and physical methods are not opposed, but that they are complementary to each other.

Probably some of my readers may think it an exaggeration to place the value of physical healing methods on a par with bacteriology, and therefore I would direct attention to what may be expected from these methods.

There can be no doubt that the successful treatment of lupus and cancer and several skin diseases, incurable in former times, is as important to suffering humanity as the cure of diphtheria with the serum of Behring. So the successful treatment of joint diseases, even of tuberculosis and gonorrhea of the joints by means of passive and active hyperemia after Bier's method, is a valuable achievement. By this method we are able, in the overwhelming

majority of cases, to remove at once the pain and to get a useful, and more or less movable joint. The brilliant result of Professor Lorenz's treatment of club-foot, congenital hip luxation and curvature of the spine are still fresh in our memory. Our results in curing heart diseases were very unsatisfactory in former times, now with hydrotherapy and the so-called Nauheim treatment, a combination of carbonic acid baths and movements against resistance, we are able to cure some patients, to improve others considerably, even more than with digitalis. The diseases mentioned partly endanger life, but there are plenty of maladies not so bad, which cast a cloud upon the patient's existence. For instance, chronic constipation caused by atonia of the bowels is an ailment for which our advice is often sought. We know that we can never cure it by the administration of physics, that, on the contrary, we often make it worse by this kind of treatment, procuring only temporary relief. By a combination of hydrotherapy, massage, gymnastics, and dietotherapy, we are able to effect a permanent cure, excluding, of course, cases of organic obstruction, and this without injuring the stomach and the bowels with irritating cathartics. Several other disturbances of the gastrointestinal tract, as nervous dyspepsia, and acute and chronic catarrh, are also very favorably treated by these methods.

The manifold functional diseases of the nervous system were successfully treated in former times by means of hydrotherapy, electrotherapy, massage, and gymnastics and the only modern change is that the methods were improved and administered more systematically. We are not able to influence organic nervous diseases to any great extent; the only decided success which can be reached by treatment, eliminating the specific cure of tertiary syphilitic affections, is a relative cure in very few and a distinct improvement in many cases of tabes by the so-called Frenkel treatment, consisting of special exercises and Nauheim baths. Very often not only the atactic symptom-complex disappears for years, but the paralysis of the rectum and the bladder is also improved very materially.

In cases of neuritis and neuralgia we certainly

get equally as good results as by means of drugs. For sciatica, physical methods are immensely superior. In functional impotency the only successful results have been attained by these methods, combined with hypnotic suggestion.

As to the diseases of the respiratory tract, including pneumonia and tuberculosis of the lungs, the symptomatic value of hydrotherapy is acknowledged by all. Another physical method very valuable in cases of difficult or suppressed expectoration in bronchitis or tuberculosis, is a special kind of tapping massage, proposed by Dr. Erni, of Switzerland, and warmly recommended by one of our most critical scientists, Professor Sahli, of Bern. Besides the influence on the expectoration, a diminution of the dyspnea can be observed and the night-sweats also disappear.

In the treatment of disturbances of the metabolism these methods are of great value. In Basedow's disease we may be able to relieve some of the symptoms. This is possible by Nauheim baths, the heart coil of Winternitz, constitutional massage, as well as special massage of the spine after Zabłudowski, vibration massage of the same, and a very careful and individualizing hydrotherapy.

In diabetes mellitus, by means of constitutional massage and systematic exercises, the quantity of the sugar in the urine can be decidedly diminished. But these means must be administered carefully, and individualizing and overexertion must be avoided. Even more attention must be given to the hydiatric treatment and proper dietetic treatment ought never be omitted.

In obesity, beside the dietetic treatment, massage, hydrotherapy (consisting of sheet baths and electric light baths) and gymnastics have proved very successful. In some stubborn cases of chlorosis, resisting the usual treatment, we can succeed by massage and hydrotherapy, combined with a proper diet.

The therapeutic value of salt baths and air baths in scrofulosis is well known.

In cases of inflammatory rheumatism not amenable to the usual treatment with salicylates, local hydiatric applications are often

very beneficial. With the Bier treatment we are able to diminish the pain considerably. After the disappearance of the inflammatory symptoms, we are able to remove the adhesions in the joints by massage and also the pain and the stiffness. Electrotherapy and sandbaths are also of high value.

Arthritis deformans and chronic rheumatism of the joints and muscles are the principal diseases benefited by treatment with active hyperemia produced through hot air or electric light baths, or with passive hyperemia after Bier, both combined with massage. In gout we are able to shorten the acute attack as well as to prevent relapses.

Also in acute diseases we make a beneficial use of physical methods. For instance, in typhoid fever, the hydropathic treatment has been found superior to any other treatment. The hydrotherapy of this disease is the best known to the profession and so it happens that very often the mistake is made to apply the same treatment in the other infectious diseases; this is wrong; the treatment so useful in typhoid fever is unsuitable for scarlet fever or measles. Here, too, we must individualize very carefully.

Very briefly I would call attention to the manifold applications of physical healing methods to nearly all ailments. Of course, in many instances, we are as yet in the initial stage, we do not see our way clearly, but, nevertheless, these methods are even now so important that every physician ought to know them. To render this possible it should be required that all medical colleges give their students an opportunity to become thoroughly acquainted with the different methods, and that postgraduate courses be established for physicians who are practitioners.

Even the very busy specialist and general practitioner, who have not the time to practice the methods themselves, ought to be acquainted with them so far as to know what methods to resort to in order to obtain the best results.

In the larger hospitals, especially in those of the colleges, the necessary equipments ought to be at hand and physicians ought to take up physical healing methods as a specialty. But,

it must be understood that for these purposes it is not sufficient to procure the latest apparatus, but, that also a practical study under skilled direction is absolutely necessary, the opportunities for which, in America, are as yet very limited. A more or less complete set of the necessary apparatus is found only in sanatoriums where the treatment is generally given by nurses, who are sufficiently proficient to give the proper application. There is no possibility for students to become acquainted with these important methods during the time of their study. Of course, electrotherapy is taught in most medical colleges, but to my knowledge in this country there is only one chair for hydrotherapy. Massage in some training-schools for nurses is taught in a manner it should not be. There is much improvement necessary in this direction, and I believe that Germany is at present the only country giving to the students of medicine the means to become thoroughly acquainted with physical healing methods.

The modern development of physical healing methods has produced new views in the policy of the profession. All over the world the medical profession suffers by ever-increasing quackery. In this country, I am told that quackery by means of physical healing methods is increasing. Through this, the economic position of the profession is becoming worse and worse. These quacks, when intelligent, learn to handle their apparatus with skill and so it sometimes happens that they are able to cure a patient who was not cured by medical advice. Medical science is thus seriously compromised. I am convinced that such quackery would soon die out if physicians were thoroughly and scientifically educated in the physical methods to cure disease.

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#### Reclassification of Gastroenteric Disease.

—The pediatric department of the Harvard Medical School has, during this year, taken up the subject of a new classification of gastroenteric diseases on an etiological basis. Professor Rotch has organized the movement, and has endeavored to further its acceptance in the other universities.

## INTUSSUSCEPTION WITH SPECIAL REFERENCE TO DIAGNOSIS.

BY

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It is not the purpose of this paper to present an exhaustive discussion of this affection, but to set forth the symptoms that will enable an early diagnosis to be made, and to differentiate it, so that the patient can be given the best chance of relief by an early operation. These observations are based upon the study of about 1,300 cases of intussusception occurring in infants and children, gathered from the literature, and a few in my own experience. Of this number, Hess, of Chicago, has collected 1,028, Cole and Clubbe, of Australia, 210, Wallace 20, and 24 I have collected from the literature and my own records, the names of the authors being given in the bibliography. Early diagnosis is so essential that I have sought to discover from this large number of cases some means that will enable us to recognize the condition before the picture is too clear to be of use.

Any man who is practising among children must bear constantly in mind the possibility of this very dangerous affection. When this point is gained, more than half the battle is won. Clubbe states that the hospital internes in Melbourne rarely fail to "spot" these cases, so well drilled have they been as to its possibility.

Always suspecting it, the diagnosis would be very easy if the cases always presented the classic symptoms. But then the diagnosis of any disease would be easy if the patients would be so accommodating as always to present the syndrome of a typical case! A previously healthy child is seized suddenly with violent paroxysmal pain in the abdomen. The child soon begins to vomit, and continues to do so, especially when given anything by mouth. It has considerable tenesmus, and, after a few hours, passes bloody stools, but no feces. The skin is cool and rectal temperature low, but pulse and respiration are rapid.

It soon passes into a state of collapse, and all

efforts at obtaining an evacuation of the bowels are futile. An examination of the abdomen shows a sausage-shaped tumor usually in the left iliac region, which can also be felt per rectum.

No one could fail of a diagnosis with such a symptom-complex. The difficulty lies in the fact that any one or more of these symptoms may be entirely absent, delayed, or subdued.

Huber has reported a case in which the only symptom was pain, occurring in paroxysms, until the fourth day of the disease, when a tumor, resembling a floating kidney, was discovered in the subcostal space on the right side after the patient had been anesthetized for operation.

In one of my cases the only symptoms were shock, nausea, and constipation. In another the only symptom was a peculiar character of respiration to which I shall call attention later. Upon this I made the diagnosis which was confirmed by operation.

Because the symptoms are not always typical is the *raison d'être* of this paper. Let us consider these separately.

*Pain* is a very constant symptom. It usually occurs suddenly in a previously healthy child, is paroxysmal, and exceedingly violent. At first it is intermittent and later becomes more or less continuous. It is at first referred to the umbilicus, later there is pain and tenderness over the whole abdomen. In the cases studied this symptom was almost universal, being noted in every case but one, in which it was absent. This was in one of my own cases, an infant a year old, and if present, it was so slight as not to cause any discomfort.

*Nausea and vomiting* occurred in 90 percent of these cases. In the large majority it began early, and was more or less constant. The vomitus consisted first of the contents of the stomach, and then of bile-stained mucus. Very rarely in infants is it fecal. The vomiting is more violent, the more complete is the obstruction. It is not projectile. More often there is a great deal of gagging, with a little mucus finally expelled. In a great many cases vomiting is not a marked feature unless something is given by mouth. Whatever this may be, it is rejected very soon.

*Constipation* is one of the most misleading symptoms in the whole condition. It is impossible to say how many times physicians are thrown off their guard by the presence of stools. A child begins vomiting and has colicky pains—if the bowels did not move some obstruction would be suspected immediately; but the fact that there are a few stools, sometimes diarrheal in character, becoming bloody and mucus in character, leads to an error in diagnosis, cholera morbus or some other acute digestive disturbance being supposed to be present. Aside from the error in diagnosis, it leads to the administration of cathartics, which aggravate the real condition. It is the rule rather than the exception for the bowels to move. The evacuations are fecal at first, representing the contents of the bowel below the obstruction. They afterward become bloody and mucus in character. This latter symptom was present in 108 of Cole's 110 cases, in 156 of Hess' 160; in the 24 cases of my collection it was stated as being present in 9, as absent in 3, and in 12 no note of it was made at all.

The number of fecal evacuations will depend on the higher or lower location of the intussusception and the previous condition of the child's bowels. The bloody stools will depend on the degree of involvement of the mesenteric vessels.

*Tumor.*—Under anesthesia the tumor can be felt abdominally in almost every instance. Without anesthesia there are a great many cases in which it is impossible to be positive that it is present. In these cases rigidity of the recti muscles, when associated with paroxysmal pains, is at least suggestive of obstruction of the bowel. By rectum the tumor can be felt in a certain proportion of the cases. It was present in 17 percent of Hess' collection, in 15 percent of Wallace's, and in 14 percent of mine. Its detection is of very little value, as Clubbe has pointed out, since its appearance is usually so late that the condition of the child is hopeless.

*General Condition.*—This is of as much value, if not more, in determining the child's condition, as any other symptom. To see a previously healthy child taken suddenly ill, and within a few hours present the appearance of one long

ill, ought to call attention to the gravity of the condition.

The pulse, respiration, and temperature-ratio is greatly disturbed. The temperature is rarely high, though in some instances it may go to 102° F., or over. Usually it is below 100° F. The pulse is very rapid, and the respiration is unusually so when the normal condition of the thoracic organs is considered. In all of the patients I have seen I have noticed a peculiar character of respiration. I cannot describe it better than to say it is a half sigh and half grunt. In fact, it has seemed so characteristic that I made a diagnosis of this condition almost from that alone in one case, which was confirmed by operation subsequently. In this case there had been diarrheal movements for three days, and even within an hour before I saw the patient. There was no blood, no rectal nor abdominal tumor, no history of pain or vomiting. But the rapid pulse, low temperature, anxious facial expression and this half grunting, half sighing respiration, determined the diagnosis of intussusception in my mind, and made me advise immediate operation; which confirmed the diagnosis.

*Other Symptoms.*—The *Signe de Dance*, a depression over the right iliac region, has been noted in some cases, but I do not consider it of great value. Noble, of Atlanta, has noticed a faint sweetish odor to the breath in cases of intussusception, but I have not found this mentioned elsewhere. Tympany is not usually present until late in the disease. The abdomen is more often flat, and the muscles rigid to protect the child from pain. In some cases the tumor may be seen, and is found by the mother; but this is rather rare. Tenesmus is more marked in those cases in which the tumor can be felt by rectum. The skin is often clammy. The eyes are wide open and the expression is one of great anxiety and fright, the lips are drawn and there is great pallor.

*Differential Diagnosis.*—Grisel thinks it is important to diagnosticate the variety of the obstruction. I grant that it may be desirable, but not important; for the treatment is the same for all, and no time should be lost in opening the abdomen. You may be sure of the variety then.

In adults the affection may be mistaken for mesenteric embolism, biliary colic, torsion, bands, acute hemorrhagic pancreatitis, acute appendicitis, strangulated hernia, phosphorous poisoning, and tabetic crises. The history of the case will help to clear up the diagnosis in many of these affections. In children, however, volvulus, obstruction by Meckel's diverticulum, appendicitis, and undescended testes are the principal affections that may be confused with this condition; to say nothing of cholera morbus and dysentery which should never be, but unfortunately are, mistaken for it. Barnard has reported three cases of tuberculous peritonitis which resembled intussusception very closely. In a very young infant pyloric stenosis has to be eliminated.

Volvulus may be distinguished by the absence of the tumor, by absence of bloody stools, and by the greater tympany occurring early in the disease. When the obstruction is due to Meckel's diverticulum, the absence of bloody stools and of the tumor abdominally and rectally will aid in differentiating it. Appendicitis may be distinguished by the foregoing symptoms and by the tenderness or rigidity over McBurney's point. An examination of the scrotum should determine the diagnosis of undescended testicle.

It seems hardly necessary to go into detail regarding the differential diagnosis between intussusception and dysentery further than what has been said. The history of the cases should distinguish tuberculous peritonitis, and pyloric stenosis.

I do not care to go into a discussion of the etiology of the affection, but I do think it is an aid to diagnosis to say that constipated, breast-fed babies are more liable to the affection, and suspicious symptoms occurring in them should be carefully watched.

D'Arcy Power has shown that the diameter of the large intestine increases out of proportion to that of the small intestine during the first two years, and that there is a greater mobility of the colon because of the long mesocolon.

These etiologic factors may help us in diagnosis if we bear in mind the age of the patient,

especially of those under two years in whom cholera morbus and dysentery are more liable to confuse the diagnosis.

Barnard has urged as pathognomonic this fact: In a suspected case of intussusception he gives two enemas of turpentine in water. If the second is returned without feces and with little force, he says the diagnosis is positive.

Huber suggests that colicky paroxysmal pains, associated with rigidity of the recti and localized tenderness over the left iliac region are sufficient to warrant laparotomy.

*Treatment.*—The object of this paper is to aid in making an early diagnosis so that early operation might be performed. I believe this is the only rational treatment. A high irrigation may be used with advantage to aid in reducing the intussusception; but I would not advise it unless operative measures were used simultaneously.

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#### CHANGE IN ADDRESS.

Subscribers going away for the summer and desiring to have this magazine forwarded to them, are requested to notify us promptly, giving both the old and new address.

## BACTERIOLOGIC STUDIES OF SMEGMA.

BY

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Some two or three years ago while making experiments upon the smegma bacillus, the following organisms were quite constantly encountered in the smegma. It was my intention to cultivate the smegma bacillus, but all attempts were then unsuccessful.

*Organism No. 1.*—A coccus about the size of the gonococcus arranged mostly in pairs; groups are also seen; there is no capsule demonstrable. It is aerobic and facultative anaerobic; stains with all the anilin dyes and also by Gram's method. It is non-motile, though there is quite an active Brownian movement. Growth occurs at room temperature though it is more abundant at 37° C. Upon agar plates there are small, raised, circular, regular colonies of a dull lemon-yellow color with smooth glistening surface. The growth upon agar slants is abundant, irregular, with no especial characteristics and the whole is of a lemon-yellow color.

In gelatin stab culture the growth is most abundant upon the surface and spreads out as a film; there is slight growth in the track of the needle. Upon the surface the pigment is well developed, while in the depth of the medium it is of a grayish color. There is no liquefaction. Bouillon is slightly clouded and there is an abundant amorphous sediment at the bottom of the tube which is of a lemon-yellow color.

There is no change in the color of litmus milk up to 72 hours, but after this time there is a complete decolorization of the medium with small coagulums. The growth upon potato is abundant, creamy, smooth, shiny and lemon-yellow in color. There is an abundant growth upon blood-serum with coalescence of small colonies forming a film-like growth and the pigment is also well developed. No liquefaction of the medium is noticed up to 72 hours. No odor or gas developed in any culture.

No result follows the intraperitoneal, subcutaneous or intravenous inoculation of guineapigs, rabbits, or white rats.

This organism I have decided to designate as *Micrococcus smegmatis citreus*.

*Organism No. 2.*—A coccus .9 to 1 micron in diameter arranged in pairs and grouped in irregular bunches. It is aerobic and facultative anaerobic; stains with all anilin dyes and by Gram's method, there is slight Brownian movement but no true motility. Grows well at room temperature but more abundantly at 37° C.

Upon agar plates the colonies are small, irregularly circular, whitish in color, and raised above the surface. There is a film-like growth, grayish in color upon slant agar. In stab culture in gelatin, growth follows the stab, and also develops upon the surface of the medium. There is no liquefaction. Bouillon is clouded and a whitish, ropy sediment collects. In milk there is slight acid production after 96 hours. Upon blood-serum the growth is whitish or cream colored, is raised; there is no liquefaction of the medium. No gas or odor is given off in any cultivation.

Inoculations into guineapigs, rabbits, or white rats by several methods are unattended by any results.

This organism I have decided to call *Micrococcus smegmatis albus*.

*Organism No. 3.*—A bacillus 1 to 2 microns in length, occurring principally in pairs (parallel) though irregular groups are also noticed. The ends are rounded and no filaments are seen. Swollen or slightly clubbed forms are also observed which probably represent involution forms of the organism. It is an aerobic and facultative anaerobic bacillus; stains with all anilin dyes and by Gram's method. It is not acid fast, is non-motile and grows at room temperature and best at 37° C.

Growth upon agar is whitish in color, and in plate cultivations colonies are circular, and slightly raised above the surface. Upon slant agar there is a semitransparent film-like growth over the entire surface of the medium. In stab culture in gelatin, growth follows the stab without liquefaction. Bouillon remains clear, a sediment of a light yellow color develops which is more or less ropy in consistency. There is a scant grayish-white growth upon potato. Upon blood-serum, an abundant growth almost orange-yellow in color and creamy in consistency develops. No odor or gas produced in any culture.

Inoculations into guineapigs, rabbits, or white rats by the usual laboratory methods do not produce any local or general lesions.

This organism, from its orange-yellow color which it develops upon blood-serum, I have termed *Bacillus smegmatis citreus*.

*Organism No. 4.*—A bacillus 2 to 5 microns in length, .9 to 1 micron in thickness; rounded ends, occurring grouped, ungrouped and in pairs. No capsule could be observed. Large forms with swollen or clubbed ends and exhibiting intermediate staining suggested a diphtheria-like organism. It is non-motile; aerobic and facultative anaerobic; stains with all anilin dyes, negative to Gram's method and also negative to Neisser's stain. Growth is abundant at room temperature and also at 37° C. Upon agar the colonies are circular, smooth edges, yellow in color, glistening, and creamy in consistency. In puncture cultivation in gelatin only a slight growth is evident in the track of the needle, while an abundant growth is present upon the surface of the medium. The yellow pigment is developed to a marked degree and there is no liquefaction of the gelatin. The growth in bouillon is characterized by diffuse clouding and an abundant sediment of a yellowish color. In litmus milk the color is completely discharged and small coagulums are present. Upon potato a scant, whitish growth, creamy in consistency develops. The growth upon blood-serum is abundant, dry, and of a yellow color. No liquefaction of the medium noticed.

No pathogenic or pyogenic result is observed in the guineapig, rabbit, or white rat by ordinary laboratory methods of inoculation.

This organism possesses many of the peculiarities of the chromogenic pseudodiphtheria bacilli of Bergey. It differs from these organisms, in not responding to Gram's method positively, and in its behavior in milk cultivations. From its rather constant faculty to produce pigment upon almost all culture media, I have decided to refer to this organism as the *B. smegmatis subflavus*.

These organisms appeared to me to occur so commonly in smegma that a brief description of each does not seem out of place. The only organism mentioned by any investigator taking up studies of smegma is the smegma bacillus. This organism, as is well known, resembles the tubercle bacillus, morphologically and tinctorially. Several observers claim to have isolated the bacillus upon some special culture medium, but these claims lack confirmation by the majority. In no reference at hand have I been able to find any literature bearing upon other organisms in smegma beside the smegma bacillus.

The organisms are probably saprophytes existing in all specimens of smegma, but their close resemblance, morphologically, to wellknown pathogenic bacteria, ought to make us more careful in making a diagnosis by spreads alone.

From the studies of these organisms it seems very apparent that the peculiar odor, which is characteristic of smegma as a rule, is not due to any one of these organisms solely but that it may be due to the symbiosis of the several bacteria mentioned, or to varieties that up to the present have resisted cultivation or have not been cultivated.

## DRAINAGE IN THE TREATMENT OF ACUTE APPENDICITIS.

BY

JOHN G. SHELDON, M. D.,

of Kansas City, Mo.

There seems to be no generally accepted rule for the employment of drainage after operations for acute appendicitis. This is as evident in observing the operations performed by the masters of surgery, as it is by having an intimate acquaintance with the work of the occasional operator who, usually under protest, now and then performs an operation for appendicitis. One sees the great surgeon remove a gangrenous appendix, associated with macroscopic periappendicular changes, with the patient's temperature 102° or 103° F., and close the wound without drainage. The next operator, who has an equal professional standing with the previous man, will not only insist on draining in such a case as this, but will employ drainage in all acute cases in which there is a rise of temperature regardless of the presence or absence of macroscopic periappendicular inflammatory changes. It is not surprising that the physician, who performs an operation for appendicitis once in six months, should make the mistake of employing unnecessary drainage; and, when we consider the lack of advice regarding drainage in acute appendicitis, it is not just to criticize the occasional operator for not giving his patient the best opportunity to recover on account of the neglect to use a drain.

A rule that can be safely followed, and to

which there are few if any exceptions, is to employ drainage after every operation for acute appendicitis that is associated with a rise of temperature. This refers to all cases regardless of the presence or absence of pus, adhesions, or macroscopic periappendicular inflammation.

The indications making it advisable to observe this rule in operating are not based upon a series of deaths following a neglect to employ drainage in acute cases, but from observing that when drainage was employed recovery was more rapid and pleasant, and from observing pathologically that in cases of appendicitis in which there is a rise of temperature, a periappendicular infection as a rule exists, and after operation a toxic and oftentimes infectious exudate accumulates at the seat of the operation, which, if not drained to the surface, must be overcome by the patient.

In 1895 Bryant reported to the New York Surgical Society a case of appendicitis that at that time seemed quite remarkable. A large periappendicular abscess was drained and an appendix removed that showed evidences of inflammation but was not perforated or gangrenous and showed no macroscopic paths of extension of the inflammatory process from within the appendix to the periappendicular structures. Today such a case would not be considered a curiosity in any sense of the word. Those who have operated in 100 cases have doubtless observed similar cases. Several years ago Stengel and Kneass were able to demonstrate that even in the mildest cases of appendicitis germs were found through all of the coats of the organ. It is probably true that in most acute cases of appendicitis, infective microorganisms pass through the walls of the appendix and, in all serious cases, are present in the periappendicular peritoneal space and that this occurs without perforation or gangrene of the organ.

About three years ago I made bacteriologic examinations regarding the presence of periappendicular inflammation in acute appendicitis without gangrene or perforation in 20 cases. In these cases no adhesions were present and

the only abnormal macroscopic change to be observed was the presence of what seemed to be an abnormal amount of serum around the cecum. In 19 of these examinations the colon bacillus was found; in the other a streptococcus was present in this serum.

Clinically I do not think it possible to offer the reports of cases that would prove the necessity of draining after operating for all acute cases of appendicitis. Most of these acute non-perforated cases, treated by drainage, would doubtless have terminated in recovery if the wounds had been closed. This, to my mind, does not prove at all that it is unwise to drain in these cases; but simply testifies favorably to the resistance of the patient and the ability of the peritoneum to deal with infection. It does not mean that the operator has used the best judgment, or that the patient has had the best opportunity to recover.

The most convincing argument in favor of drainage after operations for acute appendicitis is the comparison of a large number of similar cases operated without drainage, with a corresponding number of cases in which postoperative drainage was employed for from 12 to 48 hours. Comparison of the temperature, pulse rate, postoperative pain, abdominal distention, urinary findings, restlessness and intestinal paresis in these cases, will speak decidedly in favor of the employment of drainage. A trial of drainage in 50 cases will, I think, be sufficient to convince most operators that, in the treatment of acute appendicitis, he who drains best cures best; and that if postoperative drainage is employed in all cases running a temperature, postoperative suffering will be greatly diminished, and occasionally a patient who is a poor operative risk, and otherwise would succumb, will be saved by the employment of temporary postoperative drainage.

**Medical Education.**—Professor Charles S. Minot, of Harvard, has visited the universities of Missouri, Kansas, Nebraska, Iowa and Louisville, and at each of these delivered an address before the medical faculty and students on the new ideals of medical education, for which the new laboratories of the Harvard Medical School stand.

## SPECIAL ARTICLES.

### ABNORMAL LACTATION: IN THE VIRGIN; IN THE OLD WOMAN; IN THE MALE; IN THE NEWBORN OF EITHER SEX ("WITCHES' MILK").

BY

JOHN KNOTT, A. M., M. D., CH. B., and D. P. H.  
(Univ. Dub.); M. R. C. P. I.; M. R. I. A.; Etc.

The occasional occurrence of copious lacteal secretion in the virgin was noticed and discussed even by the illustrious "Father of Medicine" himself, and had pretty surely been familiar to his physiologic predecessors for untold generations. His observations have since then been periodically reinforced by records of new cases, in all ages down to our own century. I have, myself, been consulted on three occasions by nurses of the usual attendant class, in the employment of mothers who suckled their babies, and who were, in each case, in a state of extreme mental distress, of which the startling cause in each case was the unexpected appearance of a copious lacteal secretion. In each instance, too, the very undesirable phenomenon had appeared as the sequel of some indisposition of the mother during which the latter was necessarily unable to carry out the usual physiologic function of maternity, and the baby was placed to sleep with the nurse. The girl allowed the very uneasy bedfellow with whom she was thus supplied to play with her breasts and suck the nipples, as the only possible way of procuring even a fragmentary night's sleep. And the train of consequences, in each instance, followed the same course: Increased sense of fullness and warmth in the mammary glands, which was followed in a couple of days by the appearance of a copious formation of milk. The cause of the alarm, although extremely distressing to the individual mainly concerned, yielded very easily to simple treatment. Prompt removal of the unwonted stimulus, followed by the local application and internal administration of belladonna, soon brought about complete—and uncomplicated—disappearance of the abnormal physiologic phenomena. One of these cases I published some years ago. The appearance of another within the past few days has again renewed my interest, and may, perhaps, be found a subject not unworthy of the passing attention of the readers of *American Medicine*. In this hope, I have ventured to submit for their perusal some notes which I have collected on the subject.

One of the most startling instances which I met in the earlier years of my practice and reading was the case of a girl of eight years, who had suckled her infant brother for a month. It was recorded by the great French obstetrician, Beaudelocque. The illustrious American physiologist, Dunglison, emphasized the fact that very active and copious lactation may be present without previous impregnation: "For it has been witnessed in the unquestionable virgin, in the superannuated female, and even in the male sex." Turning our attention now to the "superannuated female," I find that Dr. Gordon Smith refers to a manuscript—one of the rare and interesting collection made by Sir Hans Sloane—in which is recorded the case of a woman, aged 68, who had not borne a child for more than 20 years before, and who had, nevertheless, nursed all her grandchildren, one after the other. And Professor Hall, of the University of Maryland, published the case of a widow, aged 50, whom he had actually seen in the act of giving suck to one of her grandchildren, although she had not borne a child of her own for more than 20 years previously. In this instance, the secretion of milk had been called forth by trying to quiet the child during the process of weaning by putting it to her breast. Dr. Francis, of New York, narrated the case of a lady, who had been delivered of a healthy child 14 years before, after a natural labor. He observes that "since that period her breasts have regularly secreted milk in great abundance; so that, to use her own language, she could 'at all times easily perform the office of a nurse.'" Dr. Kennedy, of Ashby-de-la-Zouch, has described the case of a woman who menstruated during lactation, suckled children uninterruptedly through the full course of 47 years; and, in her eighty-first year, had a moderate, but regular supply of milk; and this "rich, and sweet, and not differing from that yielded by young and healthy mothers."

Dr. Stack recorded in the *Philosophical Transactions* the case of an old woman whom he had seen in Tottenham Court Road. She was then aged 64 and had not borne a child for 16 years. He found her "secreting milk after repeatedly applying her grandchild to her breasts for the purpose of quieting it, and continuing to furnish milk in great abundance up to the time of the publication of the case—an interval of four years—to the children of her daughter; who, finding her mother so useful, 'was emboldened to bid fair for an increase of issue, which, till then, she knew not how to nourish or provide for.'"

Sexual excitement I should guess to be the exciting cause in such cases as the following, mentioned by Dr. Elliotson: "I, myself, saw two married women with milk in their breasts, one of whom had never been pregnant, but always menstruated regularly, and said this had been the case for nine months; the other had not been pregnant for upward of six years, and weaned her child, and at the end of seven months miscarried, and said she immediately afterward observed the milk; which had been secreted for six months, and was increasing at the time I saw her."

Ovarian ("reflex") irritation is not unfrequently a cause, and an easily intelligible one, of the abnormal secretion of milk. The following case, also observed by Dr. Elliotson, would, I think, form an example: "I also attended a young single lady, whom I believe never to have been pregnant, but who was subject to amenorrhea, and had not menstruated for five months, and labored, apparently, under ovarian disease; milk oozed very copiously from her breasts, and the medical attendant informed me that the left had secreted it for many months."

From the consideration of the abnormal secretion afforded by the young unimpregnated and the physiologically superannuated female, we may pass to the still more anomalous cases of the establishment of the function in the male.

When a boy, resident in the west of Ireland, and long before I had imbibed the most elementary idea of the meaning of the term "physiology," I heard discussed among some farm laborers the case of a peasant of the preceding generation, who lived near the shore of Lough Gara, and who had been left a widower—with a baby of a few months old. This had occurred in winter; and, in order to supply what care and warmth he could afford, the father took the infant to his own bed. To quiet its restlessness at night, he offered his nipple, with the result, after a time, of the establishment of the lacteal secretion. During the whole of the following spring, while laboring at the planting of his potato crop, he used to "leave his loy" at regular intervals, and go to his cabin to "give the breast" to his infant child.

Professor Hall, of the University of Maryland, exhibited to his obstetric class, in the year 1827, a colored man, aged 55, who had large, soft, well-formed mammae, rather more conical than those of the female, and projecting fully seven inches from the chest; with perfect and large nipples. The glandular structure seemed to the touch to be exactly like that of the female.

This man, according to Professor Hall, had officiated as wet-nurse, for several years, in the family of his mistress; and he represented that the secretion of milk was induced by applying the children entrusted to his care to the breast during the night. When the milk was no longer required, great difficulty was experienced in arresting the secretion. His genital organs were fully developed.

In the *Philosophical Transactions* for 1741, we find an article which bears this title: "A letter from the Right Revd. Father in God, Robert Lord Bishop of Corke, to the Right Honorable, John Earl of Egmont, F. R. S., concerning an Extraordinary Skeleton, and of a Man who gave Suck to a Child." This letter bears date "Corke, Aug. 8, 1738," and after due consideration has been given to the peculiarities of the "Extraordinary Skeleton" the writer proceeds to the following history of the second item of interest:

"And now that I am engaged in writing I will venture to give an Account of a Man I met at Inishanan, about 10 miles from this Place. He was an old Man, about 70 years of Age, by Birth a Frenchman, but was a Refugee on account of his Religion, was bred a Gardener, and, by all Accounts, had been industrious till deprived of his Strength by Age.

"He asked me for Charity, and I gave him half-a-crown. I mention this Particular, that the remaining Part of the Story may not Seem to be told for the Sake of Gain. After I had done this, and was gone into the House, I heard a Noise at the Door. The Man, out of gratitude, had returned to show me a Curiosity, which was that of his Breasts, with which he affirmed he had once suckled a Child of his own. His wife, he said, died when the Child was about Two Months old; the Child crying exceedingly while it was in bed with him, he gave it his Breast to suck, only with an Expectation to keep it quiet; but, behold, he found that the Child in time extracted Milk; and he affirmed that he had Milk enough afterwards to rear the Child. I looked at his Breasts, which were then very large for a Man; but the Nipple was as large or larger than any Woman's I ever saw. Some Ladies were then passing by; so I sent him off in Haste, and have not seen him since.

"I have either heard or read of one Instance of this kind before."

In Franklin's "Journey to the Shores of the Polar Sea," the author gives an interesting case as an instance of the unconquerable parental affection of the untutored Chipewyan. Pass-

ing from other subjects to this, he alludes to the striking example of which he had recently obtained evidence:

"I shall venture to give it in the words of Dr. Richardson's Journal. A young Chipewyan had separated from the rest of his band for the purpose of trenching beaver, when his wife, who was his sole companion, and in her first pregnancy, was seized with the pains of labor. She died on the third day after she had given birth to a boy. The husband was inconsolable and vowed in his anguish never to take another woman to wife, but his grief was soon in some degree absorbed in anxiety for the fate of his infant son. To preserve its life he descended to the office of nurse, so degrading in the eyes of a Chipewyan, as partaking of the duties of a woman. He swaddled it in soft moss, fed it with broth made from the flesh of the deer, and to still its cries applied it to his breast, praying earnestly to the Great Master of Life to assist his endeavors. The force of the powerful passion by which he was actuated produced the same effect in his case as it has done in some others which are recorded; a flow of milk actually took place from his breast. He succeeded in rearing his child, taught him to be a hunter, and when he attained the age of manhood, chose him a wife from the tribe. The old man kept his vow in never taking a second wife himself, but he delighted in tending his son's children, and when his daughter-in-law used to interfere, saying that it was not the occupation of a man, he was wont to reply that he had promised to the Great Master of Life, if his child was spared, never to be proud, like the other Indians. He used to mention, too, as a certain proof of the approbation of Providence, that although he was always obliged to carry his child on his back while hunting, yet that it never raised a moose by its cries, being always particularly still at those times. Our informant (Mr. Wentzel) added that he had often seen this Indian in his old age, and that his left breast, even then, retained the unusual size it had acquired in his occupation of nurse."

It is stated, on what appears to be good authority, that this occurrence of the lacteal secretion in the adult male is, or was, common in Russia.<sup>1</sup> I regret that I have no later reference on the subject.

With regard to the general question of the occurrence of a mammary secretion in the male mammal, Blumenbach published some curious items of information. One case is that of a

he-goat, which its owner found necessary to milk on every alternate day throughout the whole year. Commenting on this case, Dr. Elliotson wittily observes, "so that, to say with Virgil, *mulgeat hircos* is not tantamount to calling a man a fool." In the *Philosophical Transactions* (1799), there is a case recorded of a bull which had been put to cows successfully, and had also rudimentary female organs of generation. According to "satisfactory testimony" this animal gave milk. There is also a case given in the *Philosophical Transactions* of a lamb, the property of Sir William Lowther, which had lost its dam, and then commenced to suck a wether that grazed in its company. The effect of the efforts of the orphan lamb was that it "brought him to milk, and was maintained by him all the summer; he had two considerable teats on his udder, each side whereof was about the bigness of a hen's egg." After the lamb had been weaned for a whole month, the milk could be made spurt to a distance of two yards.

I will now proceed to consider the existence of the mammary secretion in the newborn fetus, the "*witches' milk*" of the palmy days of sorcery and diabolical magic, when it was said to form part of the contents of many a witch's cauldron—of the orthodox necromantic type.

When a midwifery student at the Coombe Hospital, and under the instructive supervision of one of the most eminent obstetric surgeons of his generation, the late Dr. G. H. Kidd, I had an early opportunity of seeing the senior nurse express milk from the mammae of a newly born fetus. As I was surprised at the phenomenon, I made every available effort to satisfy myself on the subject of its occurrence and was led to understand that the practice was general, and that the milk was almost invariably present, especially in the male; also that neglect of its removal was sometimes followed by inflammation and the formation of abscess. The fact was vividly impressed on my mind soon after I commenced to practise, when I was asked by a lady friend to look after a poor protégé of hers in an approaching period of trouble. The lady also procured a trained and certified nurse. The labor terminated without difficulty, and as the patient was a strong, healthy, and experienced woman—having previously borne a large number of children—I saw no cause for anxiety of any kind. I always inquired after the baby's health, but was confidently told that everything was as well as could be; indeed, after about three days it was suggested by the patient her-

<sup>1</sup> Comment Acad. Sci. Petropolit., vol. iii, p. 278.

self that I "need not trouble" myself to come again, she felt so well, and "she knew what to do," and promised to be careful. It so happened that I was then called to the country, and was not able to return for about five days. I went to see my patient when I got back, to find her in very good condition, physically; but mentally, in a state of the most vindictive indignation toward her "grand" nurse, who had neglected to "draw the breasts" of her baby boy, with the result that one had become violently inflamed. An abscess had formed, which had been poulticed, and opened and discharged its contents on the morning of the day of my return visit. She had actually lodged a complaint against the nurse in the institution from which the latter had been sent. This "experienced" mother knew all about the importance of attending to the mammæ of the newborn!

Nevertheless, the knowledge of this phenomenon does not appear to have been at all generally diffused up to, at least, the middle of the present century. Bonetus<sup>1</sup> mentions it, but apparently regarded it as a rare phenomenon in the female fetus. He quotes one case from Hieronymus Cardanus, and another from Joachim Camerarius—both authors of conspicuously luxuriant imagination. He adds one case of his own observation: An infant girl of three weeks old, whose nipples yielded, during a period of eight days, a fluid rivaling milk (*liquorem lactis æmulum*). He gives no case of its occurrence in the newborn male. The distinguished Dr. Carpenter—one of the representative physiologists of his day—states that "a fluid which is probably mucus may be pressed from the nipples of many persons." In discussing the causes of abscess of the breast of infants, Dr. Maunsell observes that "the breasts of infants, both male and female, contain at birth a secretion somewhat resembling milk. Accordingly, the attendants frequently set about pressing the part until inflammation and occasionally an abscess is produced."

Blumenbach in his *Institutiones Physiologicae* (trans. by Dr. Elliotson) mentions that, "occasionally newborn infants of either sex have been known to furnish milk," but gives no illustrative cases.

So far as I have been able to ascertain, the first systematic effort to bring existing information on the subject to a definite focus was in a communication made to the "Surgical Society of Ireland," April 6, 1850, and published in the pages of the *Medical Press and Circular* on

April 17 of the same year. It bears the title: "An Interesting Case of Milk in the Breasts of a Male Infant. By Francis Battersby, M. B., Surgeon to the Institution for Diseases of Children." The author, who had evidently taken great pains in the investigation of the literature of the subject, states that, "I believe the common impression among medical men of the present day is, that this secretion is not milk, but merely resembles it." The child in that case had been brought to Mr. Battersby, when aged three weeks, by a nurse who had received him from his mother eight days before. "She then found the breasts swollen and hard, and with milk in them. She obtained from them 'the least little drop,' she stated, which had the taste of milk. The breasts have since become smaller, but are still the size of large walnuts, with the soft hardness peculiar to breasts full of milk."

For some days afterward—the limit is not stated, as it could not be definitely observed—some milk could be pressed from the breasts in this case. The baby had been first shown to Mr. Battersby on March 3, and on March 12, he reports: "I withdrew by gentle pressure on the breasts nearly a dram of milk. It was precisely similar in appearance to woman's milk. Having left it with Mr. Moore, I received from him the subjoined note:

"My Dear Sir:—Many thanks for the specimen of milk, which is most interesting, as it closely resembles that from the adult female. It is alkaline, throws up a cream, is not rendered viscid by caustic potash, nor does it coagulate when heated. Viewed under the microscope, it is seen to consist of normal milk globules of various sizes; on the whole, smaller than those contained in ordinary human milk, floating in a colorless fluid. It contains a few colostric bodies, and some epithelium. Yours very truly,

Wm. D. Moore."

The author of the communication here goes on to observe that: "It is to be regretted that the presence of casein was not here determined. The quantity of milk submitted to examination was so small that many experiments could not be tried, and Mr. Moore, convinced from its microscopic characters of its being milk, directed his attention to ascertain whether the colostric bodies seen under the microscope were sufficient in amount to give the fluid the chemical properties of colostrum. The fact of heat producing no coagulation, and of the fluid remaining unaltered on the addition of caustic potash, proves the absence of the colostric character. Of the fact of its having been true

<sup>1</sup> *Medicine Septentrionalis Collatitia Genevae*, 1684.

milk, Mr. M., from extensive observations on the subject, has not the least doubt.

"I was not again allowed to express any more milk. The breasts soon subsided, no abscess ensued, and he was growing up a healthy little child when I last saw him.

"This case is extremely interesting from its being the first in which the milk of an infant has been proved to be identical in composition with woman's milk; and the established fact of adult males, as well as male infants, secreting genuine milk, proves that the action of the uterus is not essential to that of the *mammæ*, as is generally believed."

In the discussion which followed the reading of this communication, the principal speakers gave a very good summary of the then existing state of general public professional opinion on the subject. The remarks of three are well worth quoting in full:

"Dr. Geoghegan was quite certain that in one case he had seen milk extracted from the nipple of a newborn male child, and he believed he had met it also in other instances. On the occasion referred to, he examined the supposed milk and found it to contain the oil globules and granular bodies observed in the colostrum, or first milk after parturition, but he did not submit the specimen to a chemical analysis. Nurse-tenders, who consider themselves conversant with the details of the personal care of infants, look upon the thing as by no means uncommon; and are in the habit of rubbing the swelling surrounding the nipple to facilitate the escape of the fluid.

"Dr. Darby said that within the last six months he saw a child which gave milk, or something like it, when only eight days old. The nurse-tender, who was an Englishwoman, asked him to examine the breasts of the child, and when he did so he found them in a state of inflammation. On inquiry, he discovered that the nurse was in the habit of milking the infant. He did not happen to see any of the secretion in this case, but an abscess had formed on both breasts, produced, as he believed, from malpractice on the part of the nurse; she, however, said she deemed it a part of her duty, and that acting as nurse-tender in England, she had always been in the habit of doing the same thing.

"Dr. Churchill said he had met many similar cases in which inflammation, and not unfrequently abscesses, were produced in consequence of the malpractice of nurses. If the patients were let alone, and their breasts stuped, the inflammation generally subsided. He looked upon Dr. Battersby's case as one of

great interest, because it went far to establish the identity of the secretion of milk in the infant with that secreted by the adult female."

It is interesting, in the light of our present knowledge, to note that so high an authority on the special functions and diseases of both women and children as Dr. Churchill, entertained, as well as did Dr. Darby, the idea that the mammary inflammation and abscess were always due to the meddlesome interference.

Another speaker on that occasion (Dr. Corbett) suggested that the substance observed by Dr. Geoghegan might have been vernix caseosa, but the objection was efficiently dealt with by pointing out that the fluid contained both the oil globules and the peculiar bodies of ordinary milk, and in no wise resembled the vernix caseosa.

To me it is peculiarly gratifying to have the opportunity of calling attention to the fact that the first appreciable advance on medieval knowledge regarding the interesting subject of the secretion of "witches' milk" was made in Dublin; and that the first approximation to a complete chemical analysis was carried out in our city by the accomplished father of my illustrious friend, Sir John William Moore, M. D., Ex-President of the Royal College of Physicians of Ireland.

Thanks to the better organization of clinical observation, and the rapidly improving method of chemical analysis, I am now able to lay before the reader a very full table of analyses of human milk, both adult and infantile.

The chemical composition of (ordinary) human milk has been investigated with great care by Becquerel and Vernois, who have tabulated the following results:

In 1,000 Parts.	AGE.				
	15 to 20 Years.	20 to 25 Years.	25 to 30 Years.	30 to 35 Years.	35 to 40 Years.
Water . . . . .	869.85	886.91	892.96	888.06	894.94
Solids . . . . .	130.15	113.09	107.04	111.94	105.06
Casein . . . . .	55.74	38.73	36.53	44.33	42.07
Albumin . . . . .					
Butter . . . . .	37.38	28.21	23.48	28.64	22.33
Sugar of Milk . . . . .	35.23	44.72	45.77	39.53	39.60
Salts . . . . .	1.80	1.43	1.46	1.44	1.06

In contrast with the above series of analyses we can place the three subjoined ones of the milk obtained from the *mammæ* of newborn infants:

	Quevenne.	Genser.	Faye.
Water . . . . .	894.00	957.95	. . . .
Solids . . . . .	160.00	42.95	. . . .
Casein . . . . .	22.00	5.57	5.60
Albumin . . . . .		4.90	4.90
Butter . . . . .	14.00	14.56	14.60
Sugar of Milk . . . . .	62.20	9.56	9.60
Salts . . . . .	3.40	8.26	8.30

The milk of the newborn infant is stated by Beaunis to resemble colostrum; it presents a dull white or yellowish color, and contains fat globules and granular corpuscles. The peculiarities of the small proportion of casein, and the presence of a considerable fraction of albumin, are shown in the analyses of Genser and Faye; with which, I believe, most subsequent observers agree.

The above summary will, I hope, be found to contain the most important items of our knowledge on the subject of abnormal lacteal secretion—as hitherto attained by scientific and clinical research. Illustrative cases might easily be multiplied in large number; but the amount of novelty would hardly compensate the reader who has carefully noted those collected in the present communication.

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## DIGEST OF LITERATURE.

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### SEROTHERAPY IN THE TREATMENT OF EXOPHTHALMIC GOITER (GRAVES' DISEASE).

BY

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of Philadelphia.

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The brilliant results achieved by the employment of thyroid gland and its preparations in the treatment of cretinism and myxedema have led to many investigations, having for their object the discovery of a serum or other organic product for the cure of exophthalmic goiter.

Shortly after the inauguration of the employment of thyroid extract in myxedema it was noted that when overdoses were given, symptoms of Graves' disease, especially the tachycardia and tremors, were produced.

This observation resulted in the application of the thyroid preparations in the treatment of Graves' disease by one group of investigators who then believed that faulty thyroid secretion to be the etiological factor of this condition. Cures were reported by Gauthier, Ewald, von Noorden and others. Doubt was later thrown upon the accuracy of these reports by v. Korzynski,<sup>1</sup> Richter,<sup>2</sup> and Murray,<sup>3</sup> who were in accord with the present accepted teaching, that the thyroïdal treatment of Graves' disease is not only devoid of benefit, but is in many cases harmful.

A few cases treated by the administration of parathyroid glands are reported, one by Maussu,<sup>4</sup> one by MacCallum,<sup>5</sup> and four by

Walsh,<sup>6</sup> but the results do not justify the claims made by Maussu and Jeanelize. Eight to 12 parathyroids were given over a period of several months. The basis for this treatment lay in the observation that injury to, or removal of the parathyroids in animals produced some of the symptoms of exophthalmic goiter, particularly tetany and convulsions, and it was assumed that Graves' disease was due to faulty action of the parathyroid glands. The latest investigations on this subject by Kishi<sup>7</sup> disprove the former claims, for he shows that tetanic convulsions result from the extirpation of the thyroid glands in animals, even if all the parathyroids are left behind.

All other products thus far employed are prepared upon the theory: (1) That the function of the thyroid secretion is to neutralize certain toxins resulting from metabolic changes, and (2) that the symptoms of exophthalmic goiter are due to an hypersecretion of the thyroid gland.

Working under these hypotheses Ballet and Enriquez<sup>8</sup> removed the thyroid glands from dogs, and when tetany developed, bled the animals and collected the blood-serum which was claimed to contain an excess of metabolic toxins uncombined with thyroid secretion.

Nine cases<sup>9</sup> treated by them with this serum showed marked amelioration in their condition.

Burghart and Blumenthal<sup>10</sup> later administered in six cases a similar serum obtained from thyroïdectomized goats and, from their results recommend its use in cases where rapid improvement is desired.

The value of a serum (antithyroidin) prepared by Merck from thyroïdectomized sheep was first investigated by Moebius<sup>11</sup> and has been more extensively employed than any of the foregoing. Though originally administered hypodermically it was found to be equally as efficacious, given by mouth. It may be given in doses of 5 gm. every other day or in ascending doses, beginning with .5 gm three times a day and increasing .5 gm. daily. Shultes<sup>12</sup> reports a case of Graves' disease with hallucinatory insanity cured with this serum in seven weeks.

From his results in 11 cases S. Kuh<sup>13</sup> recommends antithyroidin as an excellent palliative; in all cases he observed improvement in pulse, nervousness, appetite and weight. K. Thienger's<sup>14</sup> observations coincide with those of Kuh. C. Lomer,<sup>15</sup> A. Alexander<sup>16</sup> also report favorably on its effect.

Treatment by use of the milk of thyroïdectomized goats was instituted by Lanz<sup>17</sup> who applied it in six cases for a period of from several weeks to six months. His results were

favorable, especially in one case which he had considered hopeless.

Burghart and Blumenthal<sup>18</sup> later introduced "rodagen," a powder prepared from the milk of thyroidectomized goats and report ten cases in whom was noticed a gain in weight and decrease in nervousness and insomnia, without any marked influence upon the other symptoms. From 5 to 50 gm. were administered daily. Kuhnemann<sup>19</sup> reports one favorable result, while Rydel<sup>20</sup> and Sigel<sup>21</sup> who each tried it in three cases, found its effect unsatisfactory; and S. Solis Cohen<sup>22</sup> in one case found it to cause increased tachycardia and nervousness with renewed enlargement of the thyroid gland.

Murray<sup>23</sup> prepared a serum from rabbits rendered immune to thyroid gland by feeding them upon gradually increasing quantities, but its employment in two cases proved disappointing.

Still another modification of serum therapy was advocated by Carrion and Hallion, and their product consisted in a mixture of glycerin with both the serum and corpuscular element of the blood of thyroidectomized sheep. This preparation, named "myhème," was administered in doses of one to two drams, three or four times a day. It yielded beneficial effects in the hands of Hallion,<sup>24</sup> and Saiuton and Lepine<sup>25</sup> in three cases. The success attending partial thyroidectomy in many cases of exophthalmic goiter and the recent researches into the cytolytic action of different serums have influenced investigators to prepare serums which they hoped would have a solvent action upon the cells of the thyroid gland. The usual method of preparation of these serums consists in the injection of an emulsion of the thyroid gland of one species of animal into the peritoneal cavity of another species, then introducing the blood-serum from one of the latter into the circulation of one of the former species.

Serums thus made and investigated by Man-kawski<sup>26</sup> and Gantscharukar<sup>27</sup> abroad and by Portis,<sup>28</sup> Yates<sup>29</sup> and MacCallum<sup>30</sup> in this country were not found to be specifically thyrolytic, but produced degenerative changes in other epithelial viscera in addition to those in the thyroid gland, probably due to the hemolytic and hemiagglutinative action of the serums.

Beebe,<sup>31</sup> in his researches with nephrotoxin and hepatotoxin, modified the process of manufacture by using the precipitated nucleoproteids of the kidney and liver respectively instead of the emulsion from the glandular pulp, and obtained serums which were more specifically cytolytic.

At the suggestion of Rogers he applied

the principle to the preparation of a thyrolytic serum, inoculating rabbits with the nucleoproteids and globulins from the thyroid glands obtained postmortem from a case of exophthalmic goiter. With the resulting serum<sup>32</sup> from the rabbits Rogers<sup>33</sup> treated 10 cases of Graves' disease "with the result of three apparently perfect cures, three rescued from a critical condition and now approaching a cure, and the others more or less improved." W. G. Thompson<sup>34</sup> in reporting 42 cases of Graves' disease remarks that he never observed recovery from severe, toxic exacerbations except when the Beebe-Rogers' serum was used.

The supply of this serum was, from the nature of its source, limited, and we await further reports of its employment by other physicians.

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## RECENT EDITORIAL OPINIONS.

**The Journal of the American Medical Association.**—**PERITONITIS AND THE ABSORPTION OF BACTERIA FROM THE PERITONEAL CAVITY:** According to Buxton, bacteria injected into the peritoneal cavity are absorbed very rapidly by the diaphragm and so enter the blood. A considerable number are also absorbed by the omentum where many are taken up by phagocytes. Organisms like the typhoid or colon bacillus with intracellular toxins being absorbed rapidly from the peritoneal cavity are, in part, almost immediately destroyed by the bactericidal power of the blood, and death of the animal may result in less than two hours, from the toxins thus set free. In case such a dose of endotoxin is not fatal, the animal may recover or may succumb to a later multiplication of the bacteria 24 hours or more after the injection. The streptococcus is not so rapidly destroyed, hence death from the primary toxemia seldom occurs but may follow the extensive multiplication of the cocci after 24 hours or more. We thus have an explanation of the favorable results of the sitting posture which prevents the too rapid absorption of bacteria. We also see that the danger of pus depends on the number and kind of bacteria it contains, for the pus elements themselves are really protective agents. Irrigation, sponging and similar measures then become dangerous, chiefly because they disseminate the bacteria, so that large quantities can be taken up rapidly by the lymphatics of the diaphragm.—**IMPULSE, CRIME AND PUNISHMENT:** It is generally recognized that certain crimes are committed under the influence of impulse so strong as to be practically irresistible. If a man has done irrational deeds early in life and has a nervous heredity, responsibility in his case seems to be seriously impaired, and yet all those who have had much to do with men and women of distinctly lowered rationality know how carefully the latter plan out their crimes, and they also know that the only thing which keeps many of them in proper submission is the deterring influence of punishment and the ignominy of an unsuccessful attempt. In a word, though acting irrationally, they yet realize the nature of their act, and, if punishment were sure to follow, would be deterred from it. Again, while responsibility may be more or less impaired at the moment of commission of many fatal crimes, men continue to put themselves in the condition in which they know such impairment may take place and are

consequently responsible for their acts. The delays of justice and the many loopholes of our criminal procedure, if continued, may lead to a veritable epidemic of crimes against human life. The deterrent effect of capital punishment or indefinite loss of liberty is society's only protection.—**RONTGEN-RAY CASUALITIES:** The death of Wolfram C. Frichs, of Chicago, on April 24, adds one more to the list of röntgen-ray fatalities. Beside the inhibition of muscular action and the formation of chronic indolent malodorous ulcers often requiring amputation of entire extremities, and this without staying the process, it has been conclusively demonstrated that sterility may be produced in the human subject by repeated and prolonged exposure to the ray. With these observations in mind, the use of this important therapeutic agent should be entrusted only to licensed practitioners. Also to avoid the danger of a perfectly just malpractice suit, proper protection should be given to the parts of the patient's body not directly exposed for examination or treatment.—**APPENDICITIS AND ANGINA:** According to Kretz, acute phlegmonous appendicitis may follow acute tonsillitis, both being the result of the streptococcus. From his studies he believes the organism is transmitted from the tonsil to the appendix by the blood. These observations emphasize the importance of the tonsils in the etiology of various pyogenic infections. Kretz estimates that probably one-third of fatal pyogenic infections are associated with angina as an initial lesion.—**TYPHOID BACILLUS BEARERS AND THE PREVENTION OF TYPHOID FEVER:** Investigations of the past few years have conclusively shown that persons apparently in good health may disseminate typhoid bacilli in their urine and feces for months and years. Such individuals may inadvertently be the origin of epidemics or the cause of many sporadic cases. The infection of the urine and feces is doubtless secondary to a gallbladder infection. As yet we have no method universally practicable for the detection of the organism in the urine and feces, and if we did have such a method it would be impossible to keep patients under the influence of hexamethylenamin or to force them to submit to having their bile passages drained. Much in the way of prophylaxis may be accomplished by proper protection of water-supply and by educating the public in cleanliness, but probably our greatest hope is in prevential inoculation. According to statistics in the English and German armies, the inoculated soldiers are less liable to the disease, and when attacked show a much

smaller mortality, much fewer severe complications, a shorter course and a milder run of fever. The method is still in its infancy and may be so improved that in time we shall be inoculating against typhoid fever just as we now vaccinate against smallpox.—PLACES MAINTAINED BY ABORTIONISTS ARE NUISANCES: Conviction of professional abortionists up to the present time has been difficult, owing to the difficulty of obtaining direct evidence of a specific offense. A recent decision of the Supreme Court of New York has particular significance in regard to this problem. The court took the broad view that it was not necessary that the actual commitment of the crime should be proved to bring the case under the statute. The offense of inviting the performance of abortion and maintaining premises for its commission is, in itself, a crime against order and public decency. With such a precedent it should hereafter be an easy matter to put down illegal and immoral advertising offenders.—COMMITMENT OF SUSPECTED INSANE: As one of the results of the Thaw trial, a bill has been introduced in the New York Legislature making provision for the Commitment to a State Hospital for the Insane of a prisoner charged with felony for a period not to exceed six weeks, within which time it is assumed that a correct knowledge of his mental condition may be acquired. The idea is a good one, though in many cases the period of six weeks would be insufficient for arriving at a positive opinion. If generally adopted, however, and properly carried out, the plan would be in the interest of justice, would prevent the escape of some criminals from their just deserts, and probably prevent an occasional judicial murder. It is practically carried out in some parts of the country by a little stretching of existing laws.—UNIFORMITY IN THE STRENGTH OF TETANUS ANTITOXINS: It has been impossible to obtain uniform results from the prophylactic and immunizing use of tetanus antitoxin, owing largely to the lack of an accurate method of standardization. The Hygienic Laboratory of the Public Health and Marine-Hospital Service has now prepared a stable tetanus toxin which, under proper conditions, loses its strength very slowly. The Society of American Bacteriologists has recommended that this toxin be used to standardize tetanus antitoxin so that the unit shall be 10 times the least amount of serum necessary to save the life of a 350-grain guinea-pig for 96 hours against the official test dose of the standard toxin; the test dose being 100 minimal lethal doses of the precipitated toxin.

The minimal immunizing dose for a case of possible infection through a wound is placed at 3,000 such units. This official unit went into effect April 1, 1907. With such a standard, reliable data will soon be secured as to the beneficial effects of the antitoxin which should be of value in the proper treatment of tetanus.—MEDICINAL FOODS: The recent report on medicinal foods by the Council on Pharmacy and Chemistry of the American Medical Association gives us an idea of the true value of these foods. Their failure often to contain what is claimed for them, their great cost, their dangerous alcohol content and the optimistic and often untrue suggestions of those commercially interested have all been made public. With a realization of the worthlessness or even harmful results of many such foods, therapists should take more interest in the important subject of dietetics. Some of the products mentioned in the report will be approved by the Council, but a definite statement will be made, not only as to the alcoholic content, but as to the caloric or actual food value, so that the physician may be better able to decide whether the preparation is what he wants in any particular case.—LATIN DERIVATIVES IN MEDICAL WRITING—THE USE OF THE INTERNATIONAL MOTHER TONGUE: Owing to the great mass of medical literature, it is important that the title should reveal at a glance the special topic and scope of the article. Careful selection of a title for an article not only brings it better recognition and lightens the work of the librarian, but also may serve to concentrate the attention of the writer on the construction and order of the article and on the important question which he wishes to emphasize. The use of terms in such titles is also urged, the meaning of which is grasped rapidly by educated physicians elsewhere.—A REMOTE DANGER OF PARAFFIN PROSTHESIS: Several cases have recently been reported where, after the use of paraffin for prosthetic purposes, there has occurred a connective-tissue overgrowth at the site of injection. The tumors do not appear as a rule for some time after the injection and then many attain the size of a pea or a walnut. Sections from these tumors show a connective-tissue overgrowth, like a granuloma, with many giant cells and other evidences of a chronic inflammatory process produced by a long-continued irritation of low grade. The tumors simulate keloid and it may be that their treatment will be by no means satisfactory. With such a possibility before us, it is a question whether paraffin injection is justifiable for slight

cosmetic troubles.—**EXPERIMENTAL THERAPEUTIC STUDIES OF TRYPANOSOMES:** Ehrlich has recently discussed the results of his experimental therapeutic studies of trypanosome infections. He has found that trypan red is curative for mice infected with nagana trypanosomes if injected within 24 hours after the infection. It has no effect on animals infected with *Trypanosoma brucei*. A form of arsenic acid (atoxyl) has given good results in certain cases of sleeping-sickness. A combination of fuchsin is also effective in some of these infections. Very soon, however, if a cure is not actually brought about, the organisms seem to become immune to the remedies and again appear in the blood. The immunity seems to be specific. So Ehrlich reasons that in trypanosomes there are different protoplasmic groups with which the various substances may unite.—**SURGERY 2500 B. C.:** W. Max Müller, in a recent publication of the Carnegie Institution in Washington, publishes two plates of what may be the earliest representations of surgical operations. The inscribed tablets were found in the necropolis of Memphis in a tomb made not later than 2500 B. C. The operations represented are one each on the hand and foot, the opening of a boil on the neck, an operation on the knee and two circumcisions. The operators in the last two operations are dressed in priestly garments while the other surgeons wear the ordinary clothing of better class Egyptians. There thus seemed to have been a distinction already between those who did ordinary surgical operations and those who performed the operations of religious ritual. These pictures also seem to point out the early development of a separate profession of surgery.—**THE MAKING OF DEATH CERTIFICATES FOR EDDYITE VICTIMS:** A New York coroner's jury calls attention to the practice of certain physicians who furnish death certificates for persons dying under Eddyite treatment. The jury declares that this aids in the evasion of the State laws and requests that the practice be stopped. Physicians should be forbidden to give death certificates for patients coming into their hands already moribund after treatment by quacks. This might work hardship in certain instances but the general results would be better to the sick, to the community and to the medical profession.—**THE QUESTIONS OF OPERATIONS IN CASES OF DIABETES:** Dr. Joseph Wiener points out that a distinction should be made between disorders complicating and those merely concurrent with the diabetes. In his opinion operations for relief or correction of the former should be performed for exactly the

same indications as they are undertaken in the absence of diabetes. The abnormal products—acetone, diacetic, oxybutyric and lactic acids—in the blood of diabetic patients do harm by lowering the resistance of the tissues and thus favoring infection, and by contributing to the development of arteriosclerosis leading to dry or moist gangrene. Operation should be deferred if the urinary excretion of ammonia exceeds one gram in 24 hours. The prognosis depends on the degree of acid intoxication rather than on the amount of glucose in the urine. The administration of sodium bicarbonate before and after operation is often of assistance in offsetting this danger of acid intoxication. So far as possible, ether and chloroform should be avoided, as both tend to increase this danger.

**The Boston Medical and Surgical Journal.**—**THE CAUSE OF CARDIAC INSUFFICIENCY:** Post-mortem examination of hearts in cases of myocarditis or valvular defects frequently fails to show any very definite anatomical lesion to account for the fatal cardiac insufficiency. Many theories have been put forth but so far none giving satisfactory explanation. Aschoff and Tawara, recently from a study of hearts from 112 cases in which cardiac insufficiency was to be anticipated, have practically disproved many of the previously suggested theories and failed to find any evidence of the progressive degeneration of the myocardium or other histological changes to account for the cardiac weakness. Fragmentation they believe to be a terminal event and in no way associated with cardiac failure. They were unable to associate focal lesions with fibers of the conduction system of His except in cases of Adams-Stokes disease. These findings then force us back to the functional explanation that the gradually increasing strain finally goes beyond the reserve force of the heart.—**THE EDUCATION OF DEFECTIVES:** Compulsory education is today a proper function of government and especially so in regard to the abnormal child. In Boston, Chicago, Philadelphia and New York "ungraded classes" have been established for defective children. Teachers competent to undertake the peculiar task acquaint themselves with the methods used in the various State reformatories and sanatoriums for defective children. In these schools there is no set rules for training the children. Scientific examinations are made of the backward child and appropriate treatment given. Such care must lessen the number of defective adults, especially in our large cities.—**THE DIAGNOSIS AND PROGNOSIS OF PRIMARY ACTINOMYCOSIS OF**

**THE CENTRAL NERVOUS SYSTEM:** As a rule the diagnosis of primary actinomycosis of the central nervous system is impossible. In some cases, however, there may be found in the cerebrospinal fluid the typical organisms of actinomycosis. In such cases the abscess or neoplasm must be in direct relationship to the ventricular cavities. Lumbar puncture should therefore always be tried. It has usually been conceded that recovery from cerebral actinomycosis never occurs. The neoplastic type has given the longest lease of life, the suppurating type being more rapid in its course. If the suppuration be circumscribed, evacuation of the pus may give improvement for a time. The exhibition of potassium iodid has been useless in the cerebral form of this disease. Lumbar puncture may give temporary relief by relieving intracranial pressure.—“**THE CROWBAR CASE:**” The recent death of Dr. John M. Harlow, of Woburn, Mass., recalls the extraordinary case with which he was associated during the earlier years of his medical practice. This accident, which has caused wide and varied interest in this country and abroad, was occasioned by the passage of a tamping iron through the head of a man, Gage, destroying one eye and a large part of one frontal lobe, the iron bar being recovered some distance away. The patient recovered after a protracted convalescence. He finally died in California, May 21, 1861, 13 years after the receipt of the injury. His skull, together with the iron bar, has been placed in the Warren Museum of the Harvard Medical School by Dr. Harlow.

**Medical Record.**—**THE FUNCTION OF ALKALOIDS IN PLANT LIFE:** Aimé Pictet, in a paper recently read before the Swiss Chemical Society of Neuchatel, discusses the origin of these bodies and the part played by them in the life of plants. He says that alkaloids are not the products of assimilation but the results of the partial decomposition of more complex substances. These the plants cannot eliminate, for they have no organs of excretion. Some plants destroy the alkaloids, while in the others the process of destruction is slow and imperfect, so that the plant is compelled to confine the alkaloids to certain cells where they cannot injure the general life of the plant. Hence the localization of alkaloids in such peripheral parts as the root and fruits. The plant also protects itself by changing the products for excretion by oxidation, combination, or both, so that they become less poisonous to the plant.—**TROPICAL NEURASTHENIA:** Individuals going from temperate latitudes to tropical regions after a time suffer from what

Woodruff calls tropical exhaustion. Fales, in a recent publication, states that nearly all American women and a large proportion of men who have been in the Philippine Islands for more than a year suffer from this condition of nerve exhaustion which simulates closely the neurasthenia seen in this country. The malady usually responds favorably to a change of climate. Among the etiological factors of this condition have been suggested the lack of willingness or ability to conform to the habits of the natives in regard to work and rest, and the nervous exhaustion of certain tropical diseases as dengue and amebic dysentery. Alcohol probably has little influence. Woodruff emphasizes the exhaustion brought about by the overstimulation by the actinic rays, the high temperature and the high humidity which prevail in the Philippines. He also states that the best age is from 20 to 35 years and that no man over 55 should go there for more than a short visit. Fales believes that the tropics should be avoided by blonds, large men with great musculature, those with tuberculous tendencies, those having gastrointestinal disorders, neurasthenics of all sorts, women, children, and old men. However, with proper periods for rest and proper protection from the actinic rays, the dangers are perhaps not so very great.—**THE APPLICATION OF NEW METHODS OF CHEMICAL COPROLOGY TO THE DIAGNOSIS OF DISEASES OF THE INTESTINE:** The methods of coprology have recently been added to by Dr. Albert Robin, who has proposed the examination microscopically, chemically, and if necessary bacteriologically of the fecal residuum of a test-meal so composed as to call forth the activities of the various intestinal glands. The method makes possible a more precise diagnosis of certain disorders designated as duodenal dyspepsias, enables us to detect the existence of pancreatic in addition to biliary deficiency and gives us data on which to base rational therapeutic treatment. In many purely functional digestive troubles this method becomes a reliable guide in the construction of a rational diet adapted to the digestive capacity of the patient.—**THE TOXIC REACTION FOLLOWING EXPOSURE TO THE RONTGEN RAYS:** Of the deleterious effects of the röntgen rays on the internal organs, the most marked and perhaps the most dangerous is the reaction which in many ways simulates an acute intoxication and often so severe as to terminate fatally. This subject has recently been studied by Edsall and Pemberton especially in connection with three cases in which a most severe reaction occurred after one exposure to the rays, so severe as to prove

fatal in two of the cases. In these two cases there was noted beside the marked prostration a decided drop in the excretion following the exposure, this drop being followed by an equally striking rise to a point much beyond that to which it had previously been. In explanation of this curious phenomenon the investigators suggest that probably the marked toxic condition is due to the fact that the organism is overwhelmed by the necessity for carrying on the complete disintegration of a mass of products of tissue destruction, and as the body reacts, the complete disintegration is accomplished and the products are excreted. The fact that the patients were already the subjects of toxemia probably makes easier the occurrence of the condition under circumstances which would not normally have been present.—**ACUTE DILATION OF THE STOMACH:** L. A. Conner has recently made an analysis of the 102 cases of acute dilation of the stomach occurring in the literature. This study shows that the condition occurs most frequently after operation under general anesthesia, and is usually associated with a constriction of the lower end of the duodenum between the root of the mesentery which crosses in front of it and the vertebral column. This constriction can only be brought about when traction is made on the mesentery by the small intestines hanging over the brim of the pelvis. It is favored by the dorsal position, a long mesentery and collapsed state of the gut. It is uncertain whether the dilation of the stomach or the constriction of the duodenum constitutes the first step in the process, but there seems little doubt that in some cases, at least, the duodenal obstruction is primary. The condition should be recognized if the possibility of its occurrence be kept in mind. The mortality is high (72 percent), but can be lowered by early recognition and treatment of the condition. The latter consists in repeated and thorough emptying of the stomach, rectal feeding, and change of posture to relieve the condition. Operative measures have not been satisfactory.—**THE SUBCUTANEOUS INJECTION OF SALT SOLUTION IN CHILDREN:** Baginsky has recently emphasized the great value of saline infusions of hypodermic injections in children in preventing damage to the heart in a variety of conditions, and also in replacing fluid lost through diarrheal or other diseases. The most effective manner of application is with a large hypodermic syringe, by means of which 100 to 200 cc. may be injected at a time.—**THE RESPONSIBILITY OF THE COUNTRY PRACTITIONERS FOR THE EXISTENCE OF TYPHOID FEVER:** It seems well established that typhoid fever is a

country bred disease and is transmitted to the city by various methods, as, for instance, water courses supplying cities, green vegetables, fruits, etc. Dr. Daggett, of Connecticut, has therefore, advocated a system of sanitary police for properly investigating the water-supplies of communities. This seems to meet the problem only half way. The source of infection is in the discharge from typhoid patients, and the physician attending such a patient is the one to whom the community must look for protection. The importance of proper disinfection of the feces and urine from typhoid patients should be forcibly impressed especially on the country practitioner.—**RENAL DECAPSULATION FOR ECLAMPSIA:** De Bovis recently performed renal decapsulation in a young woman who developed a severe eclampsia soon after delivery. The result was good and the woman recovered. In view of the fact that in eclampsia the kidney is not the only organ involved, it is rather difficult to account for this improvement. The operation for the present must remain *sub judice*, although future experiments may contribute to its better understanding and appreciation.

**New York Medical Journal.**—**THE PUBLICATIONS OF THE BUREAU OF ANIMAL INDUSTRY:** This bureau was established 25 years ago, and its first annual report was published in 1884, with annual reports each year since that date. In addition, many pamphlets and circulars on special subjects have been circulated. The department now issues a monthly list of its publication, giving information how they may be obtained. The "Animal Industry" is of importance to the farmer and to the entire community, on account of the close connection between the health of our domestic animals and our own. The importance of proper conditions under which milk and its derivatives are furnished also has its bearing. The Bureau has been active in these investigations and has provided us with much of our present knowledge concerning them.—**THE BIOLOGY OF DIPLOCOCCUS INTRACELLULARIS:** As a result of the commission appointed by the Department of Health in New York, early in 1905, for the investigation of cerebrospinal meningitis, Dr. Flexner has recently published three papers on the etiology and pathogenesis of the disease. The *Diplococcus intracellularis* grows best on mediums made with sheep instead of human serum, and must be repeatedly transplanted to fresh mediums. The brief vitality of cultures depends on the presence of soluble disintegration products set free by the dissolution of the organism and on exhaustion of the nutrient ma-

terial in the medium. Cold and salt solution are inimical to, while the addition of a calcium salt favors the growth of the organisms. The disintegration of the dead organisms is probably due to an enzyme, the action of which may be prevented or diminished by potassium cyanid. The organism has a low and variable pathogenic action. The death of the inoculated animals is probably due to the action of a poison liberated from the disintegrating bodies of the bacteria and not to a secreted extracellular poison. Multiplication of the organism is not essential for the production of the peculiar symptoms and lesions.—EXPERIMENTAL CEREBROSPINAL MENINGITIS IN MONKEYS: Flexner has been able to reproduce lesions in monkeys, similar to those found in man, by the subarachnoid injection of pure cultures of *Diplococcus intracellularis*. When introduced into a low level of the spinal canal, the organisms rapidly set up an acute inflammatory reaction, the exudate from which accumulates chiefly in the lower portion of a subarachnoid space of the spinal cord and at the base of the brain. This distribution is rather against the theory of the entrance of the organism in man through the nasal mucous membrane. In monkeys the inflammation extended over the olfactory lobes and along the dura mater through the cribriform plate of the ethmoid to the nasal mucosa; smears from which showed Gram negative diplococci similar to the *intracellularis* though the specific organism could not be cultivated. In monkeys large quantities of the active culture are necessary to cause symptoms or to produce death, and the amount of multiplication of the diplococcus is smaller than in man.—OUR NEGLECT OF PSYCHIATRY: One of the serious defects in the scheme of medical education at the present time in the United States is the almost total neglect of the subject of mental diseases. The teaching of psychiatry by diactic lectures as carried out in many medical schools is a farce because of the lack of clinical material. And the situation of asylums at some distance from the medical schools often makes it impossible to make use of the clinical material in them. This lamentable ignorance on the part of the general practitioner is probably responsible for much of the misery, sickness, crime, and premature death, which could be prevented if the early stages of many insanities were better appreciated. Instruction should be given almost exclusively in hospital wards, and so it seems highly desirable that a large hospital for the insane should be readily accessible from any school which is to teach psychiatry satisfactor-

ily.—SERUM THERAPY FOR EXPERIMENTAL INFECTIONS WITH DIPLOCOCCUS INTRACELLULARIS: The New York Department of Health's commission has been investigating the effects of antisera prepared from the diplococcus serum. The use of an homologous antidiplococcus serum resulted in the recovery of several monkeys from an experimental infection with the *Diplococcus intracellularis*. The best results were obtained when the serum was injected into the subarachnoid space, either simultaneously with the organism or six hours later. Normal monkey serum, when injected simultaneously with a quantity of culture which would cause death in a control animal within 24 hours, appeared to hasten the fatal outcome. On the other hand, where the dose of culture was on the border-line of the lethal, the serum appeared to have a certain definite protective value. While these results do not appear very hopeful for this method of treatment of human cerebrospinal meningitis, it is probable that more active antisera may be produced by appropriate means of immunization.—PREGNANCY AND HEART DISEASE: Dr. Jules Bernard has recently collected a number of clinical facts which seem to show that pregnancy is quite normal in more than half the patients presenting cardiac lesions. Accidents usually do not appear until after several pregnancies, when the overworked myocardium finally gives way. Cardiac symptoms are more frequent during the beginning of pregnancy or in the puerperium. Spontaneous abortion is infrequent. Induced abortion is a dangerous procedure in these patients and such intervention should be carefully considered. The cardiac patient who has successfully passed through her pregnancy may be allowed to nurse her child, but both mother and child should be carefully watched as to their general health.—FORMALDEHYD DISINFECTION AND CONFLAGRATION: Professor La Wall has recently outlined the precautions necessary to avoid the danger of fire in the use of the methods of disinfecting rooms by mixing potassium permanganate with a solution of formaldehyd. Briefly they are, that only small quantities of the chemicals should be used, at least in any one container, that the containers should be placed in larger ones containing water, that all extraneous sources of ignition should be removed, and that the generators should be placed so that any flame which may possibly rise will not be near inflammable objects. An umbrella-like device might be added to check the undue ascent of any flame which might be kindled.—THE AS-

**SOCIATION OF AMERICAN PHYSICIANS:** The twenty-second annual meeting of this association was one of the best attended meetings which the association has held in recent years. Among the most noteworthy features of the program were the remarks of Dr. David L. Edsall, on ward infections in hospitals, and the papers on opsonins. Dr. Edsall pointed out that small epidemics of infectious disease may pass through a ward from neglect of some essential feature of sanitation. The discussion on opsonins in medicine indicates that the majority of observers are not adhering to the Wright technic, thus accounting for the divergent results of reported observations. The efficacy of the "bacterial vaccine" treatment of subacute and chronic infections has become an established fact. It may in time be proved that the opsonic index, as a guide to the proper administration of bacterial vaccines, is not as trustworthy as Wright believes.—**FICTION AND THE FIGHT AGAINST TUBERCULOUS DISEASE:** The story writer has at last been enlisted as a powerful agent in the campaign for the open-air life in the treatment of tuberculous disease. In *McClure's Magazine* for May a well-told tale, under the title "A Fight in One Round," hinges upon the cure of a case of tuberculosis by resort to outdoor life. Such stories reach a class difficult to reach through technical literature. Other stories of this nature should be encouraged, if necessary, by the awarding of prizes.—**THE INSPECTION OF IMPORTED FOODS:** The true cause of the opposition of the National Pure Food and Drug Law is the fact that it requires manufacturing concerns to give up their careless, shiftless methods and to adopt a scientific basis. The former methods are easier to carry out and so appeal to the lazy man. The use of preservatives in the quantities usually employed is not especially dangerous to health, but their use puts a premium on filth and destroys all incentive to cleanliness and scientific principles in the selection and preparation of the products. The work of the Department of Agriculture is most praiseworthy.—**THE SPIROCHÆTA INTERROGANS:** Stimson, in staining some yellow fever material by the method of Levaditi, found a very definite organism in the kidney, for which he has proposed the above name. In some fields no organisms were present, in others large numbers were present together. Stimson suggests the species name of *interrogans* from its frequent resemblance to an interrogation point, and he seems to assign it to the genus *spirochæta*.

**The Pennsylvania Medical Journal.**—THE

**DIAGNOSTIC AND PROGNOSTIC VALUE OF THE EOSINOPHILE LEUKOCYTES IN THE CIRCULATION OF THE BLOOD:** An increase in the proportion of the eosinophile leukocytes in the blood has been observed in connection with certain diseases of the skin, a number of infectious diseases and some forms of animal parasitism. In typhoid fever, however, the total number and the proportion of eosinophiles are diminished, probably due to the inhibitory influence of the typhoid toxin on the activity of the bone-marrow. Dr. Leonard Blumgart has recently found that these cells are usually entirely absent in severe forms of typhoid, while in the mild forms they were often reduced to 0.2 percent. In cases of moderate severity he found that the eosinophiles begin to reappear at the beginning of the fourth week. Repeated differential counts of the leukocytes in typhoid fever should therefore be of prognostic value.

**Personal.**—FRANK BILLINGS, dean of the Rush Medical College, has been elected president of the National Association for the Study and Prevention of Tuberculosis.—GEORGE A. PIERSOL, professor of anatomy at the University of Pennsylvania, was, on May 2, elected president of the Pennsylvania chapter of the Society of Sigma Xi.—ORRIN A. TOMPKINS died June 11, 1907, at his home in Randolph, N. Y., aged 66; he was graduated from University of Buffalo in 1865 and practiced in Randolph and vicinity 42 years.—DANA W. HARTSHORN, aged 80, of Cincinnati, former dean of the Pulte Homeopathic Medical College, who was major surgeon on General Sherman's staff during the Civil War, has just died. It is said he was the last surviving member of General Sherman's staff.—ACHILLES ROSE, of New York, has been elected the corresponding member of the Medical Society of Athens, in recognition of his labors to reform the technical medical language of physicians. The society is one of the leading medical organizations in the world.—VON BEHRING'S recent trip to Constantinople was prompted solely by his eagerness to examine the effects produced by the "bacterial fat" which is used there by Professor Dycke and Dr. Reyschad Bey as a remedy for leprosy.

**The German Public Health Association** will hold its annual meeting this year at Bremen, September 11 to 14. The program of questions proposed for discussion includes cerebrospinal meningitis, disinfection, friendly societies and public health, garden cities and hospital construction.

# American Medicine<sup>367</sup>

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**State Examining Board should omit therapeutics** is the startling suggestion of Dr. C. A. L. Reed in his address to the Legislative Council of the American Medical Association. Perhaps here we have a suggestion so valuable that it might be true inspiration, for if logically carried out it would end the double and triple boards which really serve to keep up distinctions between practitioners which are truly ridiculous. There is practically no quarrel between the various "schools" except on the question of dogmatic therapy, and that quarrel is so feeble and senile that we can almost hear its death rattle, anyhow. It is a notorious fact that a few of the irregular dogmatic schools have such excellent courses of instruction in the other branches, that their graduates pass the State boards with flying colors, and some of these colleges, too, were the leaders in the movement for a four-year graduated course—to the shame of many a "regular" college.

## **The Real Qualifications for Licenses.—**

Reed truly says that if a candidate is properly grounded in anatomy, physiology, and pathology, with all their subsidiary branches, including obstetrics and surgery, he can be safely considered competent to judge for himself what is proper to do for a patient, and that it is no concern of ours what his dogmas are—we all have unconscious dogmas, by the way. The college from which he graduates is wholly immaterial and need not even be known to the examiners, pro-

viding he shows he is educated in all those sciences which even the osteopath claims are necessary. This plan may flatly end the whole campaign of osteopaths and other uneducated men, to a license to practise. The examination will be the same for every candidate, and if he is able to pass it, he is known to be educated enough to be a safe man, no matter whence he hails or what he claims to think in therapy. The disappearance of legalized quackery will follow as a matter of course. The medical profession will become truly united as the ancient quarrels appear ridiculous. We earnestly commend the suggestion for serious discussion by our homeopathic and eclectic friends.

**"Licensed practitioner of medicine or surgery"** may yet become the coveted honor and title of all physicians and surgeons, if Dr. Reed's suggestion is accepted. If it could be made the only legal title to put upon one's office sign or stationery it would also help to wipe out distinction of sects, dogmas and "schools." The great English surgeons are plain "Mister" and resent being called "Doctor"—a title which is meaningless with us also. Why should American physicians and surgeons be so set upon being called "Doctor" when the universities give the title with lavish hand to ironmongers and politicians? A State license is evidence of education in medicine, and proof that the possessor is not an uneducated osteopath. By all means let

therapeutics be omitted from examinations if the candidate knows all the rest.

**Life insurance medical fees** still receive comment from both lay and professional journals and we hope, in the interest of the policy holder, that the agitation will continue until the fee is restored to a point which insures a proper examination. It is an agreeable sign of the times, that laymen are at last awakening to the suicidal policy of economy which is sure to be so expensive in the long run. Medical societies will be doing a public service by combining to refuse such work unless properly paid. It is simply a public calamity that the companies have the power to pay huge sums to high officials and agents, yet jeopardize the future stability of their trust by refusing to secure the best examinations. It is imprudently asserted that two or three dollars will secure as good service as fifteen. Any protest is answered by the further imprudence that it reflects upon the honor of the physicians who are hired.

**The reduction of fees for insurance examinations** seems to be approved and defended by the salaried medical officers of the companies. There is a growing impression that in assuming this position they are not properly looking after the interests of the policy holders. This is not said in a spirit of condemnation, for it is fully recognized that the business environment of the company office is quite capable of warping their judgment by hiding from view the larger matter of human nature elsewhere. A few dollars saved to the company, or transferred to the agent's commission, may look well on statistical reports, but these tables take no account of the quality of the goods purchased—that is, the value of the examination. The profession, almost to a

man, is aware of the fact that proper examinations are not made for small fees, and their attitude of opposition is distinctly in the interests of the policy holders. We hope the medical directors will be wise enough to see the danger to themselves of the storm of criticism which in time is sure to come.

**The alleged rights of the insurance agent** have been unduly considered and have resulted in some of the scandals, relative to the methods of securing new business. Indeed, the expenses have been so inordinate that there is a disposition to limit new business by law. The agent is too often a man who has failed in other walks of life, and is too highly paid for what he does. He is supposed to devote himself to "hustling" for business instead of waiting for it to come to him. The medical examiner, on the contrary, is expected to do the work as a "side line" to general practice. When the agent gets on the same basis, the "new business" expense scandal will end, and the medical service be properly paid.

**The defect of the food law** mentioned in our January issue is the provision "that no article shall be deemed misbranded or adulterated within the provisions of this act when intended for export to any foreign country and prepared or packed according to the specifications or direction of the foreign purchaser when no substance is used in the preparation or packing thereof in conflict with the laws of the foreign country to which said article is intended to be shipped." We are informed that this is construed by the Bureau of Chemistry to refer simply to the preparing and packing for shipment, and not to the material from which the product is made. We hope that this construction will hold in the courts, for

it does seem to refer to adulteration and efforts might be made by unscrupulous exporters to evade the plain purpose of the law to guard foreigners as well as Americans. It seems to be a defect to be remedied by later amendments. The law as a whole should be given the heartiest welcome, both here and abroad, not only as advancing public health but solidifying and increasing our foreign and interstate trade. As a rule, business interests object to changes of law, even when, as in this case, it eventually benefits them. As soon as foreigners are sure that American goods are good and exactly as labeled, trade will be improved.

**The inspection of meats for export or interstate trade** is fully provided for by recent regulations of the Department of Agriculture, made in compliance with the Meat Inspection Act passed by Congress last June. In addition, meats or meat food products intended for Europe must be accompanied by a certificate, though it is not known why the rest of the world, also, should not have the benefit of a certificate. The regulations to carry into effect the Food and Drugs Act do not apply to the meat industry, for which there are now separate laws and regulations of a most stringent kind, to prevent the export of any meats which are unsound, unwholesome, unhealthful or otherwise unfit for human food. European consumers can rest assured that the American meat they use is carefully inspected in accord with European laws, and that they are better protected than Americans, themselves, who are at the mercy of local laws.

**The limitations of meat inspection** may cause future annoyance, for they apply only to cattle, sheep, swine and goats. Meat mixtures containing a small amount of meat are also excepted. All such excep-

tions come under the pure food law, and under the regulations may be inspected as often as the Secretary of Agriculture deems necessary. It has been said that horses are slaughtered in America for export or canning. The flesh is perfectly wholesome and largely consumed in Europe. There does not seem to be any objection to legalizing the business and placing it under control, for there might be an open demand for such products. Present regulations might control it, nevertheless, by implication or under the general terms of the law. As in the case of the food law, it does seem an error to permit the use of meat preservatives if the meat is prepared and packed according to the foreign purchaser's directions, and it is not in conflict with the laws of that foreign country. Foreign criticisms are to be expected and are already made, so we must be above criticism.

**The ill-paid ship's doctor** has been discussed time out of mind and the subject of his status has been again brought up. (The Hospital, Sept. 15, 1906.) His pay is fifty dollars a month, more or less, and generally less. He is given a very comfortable cabin which is generally situated so that he can be consulted by all classes of passengers, and if it is placed forward near the crew it is not intended as a slight, but as a convenience to him. It is his office and no more detracts from his dignity than to compel the chief engineer to visit the fire-room. On war vessels the surgeon lives with the other officers because he has an office elsewhere. His status on merchant vessels is not of the best, but this is no reason for the derogatory remarks so often made as to his capacity.

**Passengers are charity patients by law**, and this is the defect. Ships are compelled to carry a physician to attend cases of illness or injury, for otherwise these unfor-

tunates receive no care—a former scandal now rarely heard of. Companies find that they can secure a physician at low rates and that his income is pieced out by honorariums in the style of past generations when no fees were charged. These are looked upon as tips and the doctor is degraded to the position of a room steward. If this is really true—and we doubt it—it might be the reason why better men cannot be secured, assuming that they are inefficient. The remedy is evident. Let there be a scale of fees as in land practice, for why should the law make a pauper of a passenger? If he needs a physician he should employ one like every other self-respecting man.

**Passengers often need the best medical skill** and will naturally take those ships having it. More and more often do we hear of invalids sent away for ocean travel and actually carried on board. Modern life is increasingly producing these partial wrecks who need delicate management. They are perfectly willing to pay for medical advice and should be expected to pay for it. It seems that steamship companies would enhance their own interests and that of the passengers by employing high-grade physicians who will not desert shore practice unless well paid. There will be less criticism of the doctor's ability. It is often unjust, for everyone is led to believe that some fatalities among passengers are avoidable—a view we are loth to accept although we do believe that the standard of efficiency is not as high as it should be.

**Unlicensed ship's doctors** should be prohibited by federal law. As far as we know, it is possible for men who repeatedly fail to pass State examining boards and are barred from land practice to obtain a ship position for food and lodging, depending

upon occasional voluntary fees for their income. Who examines these men for the company? Are they appointed because some doctor asks it—quacks and all others? An examining board should be convened by law, whose requirements should be as high in this specialty as those for the deck officer in his. In reality, the tests should be the same as for entrance to the navy or marine-hospital service—then the pay would have to be increased or the positions would be empty. Influential passengers, in self-protection, should demand these reforms—and we commend the matter to the federal government and the medical profession as well.

**Pretuberculous conditions** have been described by Dr. B. R. Shurly,<sup>1</sup> of Detroit, and it does seem that there is a relation to defective nutrition—a matter of considerable importance to those who think we eat too much. The characteristics of this preliminary period are physiological impoverishment, loss of weight, general malaise, motor and volitional debility, disturbed sleep, defective digestion and hurried heart-rate and respiration, with lessened arterial pressure. There is some difference of opinion as to whether this is a latent unrecognized tuberculosis, as Shurly thinks it is, or a depraved condition upon which tuberculosis is later grafted. When the infection has proceeded to the point of hemoptysis and fever, röntgen rays reveal extensive lesions out of all proportion to the physical signs—even cavities can form before ordinary skill in percussion and auscultation detect the signs. Since, also, incipient tuberculosis is impossible to detect in its early stages, it is quite likely that Shurly is correct.

**The iron and arsenic treatment of the pretuberculous stage** is advocated by Shur-

<sup>1</sup> Jour. Am. Med. Assoc., June 16, 1906.

ly because of the almost invariable coincidence of a chlorotic form of anemia. He gives the drugs hypodermically and reports most excellent results. The important matters nevertheless are rest, food and cold air. Tyndale is quoted as saying "that localized tuberculosis does not endanger life of itself so long as the general nutrition begets a reasonable resisting power of the pulmonary tissues." Patients must be informed that they have overdrawn the bank account and that they must reduce expenses and increase the deposits. "Rest up, live in the open air, and eat, eat, for God's sake eat!" There is no reasonable doubt that followers of the Yale theory of economy are running the risk of developing this pretuberculous condition of poverty.

### The Great Prevalence of Tuberculosis.

—Shurly states that possibly seventy percent of our population is infected at some period of life, but that about four-fifths of the infected recover—most of them perhaps never having known that they had the disease. It may not have progressed beyond the pretuberculous stage—surely not beyond the incipient. Perhaps the lack of energy and will power of the infected is nature's way of compelling rest to diminish expenditures below the food supply. Chittenden's statement that generous feeding induces tuberculosis and cancer, cannot be too strongly condemned. The well fed have a tremendous advantage in the struggle for existence. In view of the undoubted fact proved by Robert Hunter, in his work on Poverty, that a considerable percentage (one-eighth) of our population is chronically underfed—ever on the verge of starvation, or at least, with no surplus or physiological bank account—we can well understand why one-seventh die of tuberculosis. The factor of safety is too small.

**Wasteful educational work** was the subject of an investigation made by Mr. Walter H. Page and published in the *World's Work* for July, 1906. It was primarily intended, no doubt, to help rectify the present wasteful grouping of too many colleges in certain sections. He shows that although travel is fairly cheap, college boys, as a rule, do not go far from home. Probably 75 percent attend a local institution and it is necessary to have many colleges in the towns to accommodate those boys who would otherwise not receive a higher education at all, while some other small town has two or three small colleges struggling for existence. Mr. Page is doing good work, but he has unfortunately carried it too far and advocates that which is destructive of health. He advises the establishment of all colleges in cities and deplors the old time notion that they should be set far off in the country, sometimes in the very woods. This was done to seclude the boys and remove them from city temptations which Mr. Page asserts are not any worse than in the villages. We have shown that the main advantage consisted in the wholesome living which insures proper development and fully accounts for the tremendous percentage of noted men who have been educated out of the cities. The big city "universities" do not show up nearly so well because, perhaps, the boys have been somewhat injured in health.

**City life is very deadly to the young**—a fact known to anthropologists for a long time, and we are now in a fair way to explain the phenomenon. For hundreds of years country families have flocked to the towns to die out in a few generations, so that cities are said to be consumers of rural populations. A man raised in the country seems to stand the unknown strain but his children sometimes perish long before he

does. Every physician knows of these disappearing families where the country bred parents survive all their city bred children. The trolley system which permits suburban homes is doing more for the survival of these types than the lay public realizes. Mr. Page's advice, then, to continue the damage by establishing the colleges in the cities, is deadly and should be rebuked by the medical profession at once. He states that this harmful plan is the goal toward which the General Educational Board is moving in the use of Mr. John D. Rockefeller's ten million dollar endowment. We trust they will not put this money to so bad a use, and that they will awaken to the boys' real necessity—education out of the city where nature can have a chance in building up a nervous system able to stand the strains of city life later.

**Cities are more brunet than the surrounding rural districts**—another anthropological law already explained. Competent observers in many parts of the world have called attention to the fact that city blonds do have a slightly higher sickness and mortality than the brunets and that surviving families of long duration of city life, are of a curiously brunet sallow short type such as we see so commonly among European Jews—the very type now taking possession of New York City. Why does this type survive in health, while the blonder ones die out or survive in sickness and feebleness? The suggestion has been made that the blonds are not sufficiently protected from light which in excess is so harmful to young developing cells and embryonic or atypic neoplastic cells. The negro's cells are enveloped in darkness. The Scandinavian does not need such pigment in his dark and cloudy land but if he migrates far away his children are sickly. This gives us a hint

and we should act on it. The Anglo-Saxon boy should be sent as far north as possible. The old time notion to place colleges in the woods was correct and the present tendency to reverse nature, and graduate a stream of blond city neurasthenics to become educated paupers, is a disaster. The small country colleges will be the future salvation of this country, and their graduates are now doing the bulk of the work of advancing our civilization. Gentlemen, don't waste that ten million dollars! Send the boys out of the city.

**Light therapy** seems to be sadly ignored in America, yet from Eastern Europe come reports of such brilliant successes that in comparison we appear to be actually neglecting our patients. Dr. Minin was one of the pioneers with a lamp which emitted short rays—those from the blue end of the spectrum. They proved to be very destructive of living protoplasm, though they were more harmful to parasitic invaders than to the normal cells, but even the latter were killed if the light was excessive. The anesthetic effect was pronounced if smaller doses were used, and remarkable cures have resulted in quite a number of painful affections. The uviol lamp, which emits ultraviolet rays, has been so successful in Austria that it now promises to be a permanent addition to our therapeutic resources. Unfortunately it kills the skin cells easily also, and serious ulcers result if it is not used with extreme care, and the burns resemble those of röntgen ray or radium.

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**The Cinematograph and Vision.**—The police in Berlin are making war on moving picture shows as medical authorities assert that they are injurious to the eyes. There are 200 cinematograph theaters in Berlin and its suburbs. The incessant movement of the films is regarded as especially harmful for children's eyes.

## BOOK REVIEWS.

**Essentials of Medical Electricity.**—By EDWARD REGINALD MORTON. W. T. Keener & Co., Chicago.

This book gives in brief form the rudiments of medical electricity. So far as we have seen it contains no serious error in physics and its therapeutic recommendations, while somewhat condensed, are judicious.

**Physical Chemistry in the Service of Medicine.**

—By WOLFGANG PAULI. Authorized translation by MARTIN H. FISCHER. John Wiley & Sons, New York, 1907.

This little book contains seven addresses on various phases of the subject under consideration, questions in pathology, physiology, and pharmacology being considered. The author states that the foundation thought is the extensive parallelism between the laws which govern changes in the colloidal state *in vitro* and in the living organism. This thought has been well presented and forms an important step in our modern appreciation of medicine.

**Recent Advances in the Physiology of Digestion.**—By ERNEST H. STARLING, M. D. W. T. Keener & Company, Chicago, 1906.

This book of 147 pages is made up of ten lectures delivered in University College, London, under the Mercers' Company gift to the physiologic department. The subject-matter includes the mode of action of ferments, secretion of saliva, digestion in the stomach, various phases of pancreatic action and digestion, the bile and intestinal juice, and the movements of the alimentary tract. Though delivered in 1905, the lectures form a very lucid summary of the work accomplished by Parvlow and other recent investigators in this realm so interesting to physiologist and clinician.

**International Clinics.**—Edited by A. O. J. KELLY, M. D. Volumes III and IV. Sixteenth series, 1906. J. B. Lippincott Company, Philadelphia and London, 1906.

In Volume III are considered 26 topics. Under Treatment and Medicine are discussed the treatment of acute pleurisy, bronchitis, dilation of the heart, syphilis, autointoxications, and pulmonary tuberculosis. Other subjects are accidental rashes in typhoid fever, milky urine, and life in the Antarctic from a medical viewpoint. Under Surgery are, among others, the subjects of hyperemia, treatment of swollen joints, inguinal hernia, peritoneal adhesions, and hemorrhagic diathesis. In Obstetrics and Gynecology are discussed the use of forceps and the pelvis of lame women. Rhinology and Otolaryngology include clinical rhinometry and primary thrombosis of the jugular bulb. Pathology is represented by an article on Leukemia and Sarcomatosis by G. Banti. The articles are all well written and instructive, and the volume is fairly well illustrated. The topics under Treatment in Volume IV

include electrotherapeutics, chronic nephritis, obesity, and renal or urethral colic. Among the subjects in Medicine are tuberculosis, myxedema, and disorders of the adrenals. Surgery includes fractures, hip-joint disease, vesical tumors, and hemorrhoids. Under other topics are placenta prævia, lacerations of the cervix, chronic cystitis in the female, the laryngologic complications of tuberculosis, and the mastoid operation. This number is unusually well illustrated, there being 27 colored plates in the papers on placenta prævia and repair of lacerations of the cervix, beside many uncolored plates and figures. The papers are all well written.

**Essentials of Human Physiology.**—By D. NOEL PATON, M. D., B. Sc., F. R. C. P., Ed. Second Edition. W. T. Keener & Company, Chicago.

The second edition of this popular book shows a rearrangement and an extension of certain sections which will increase its usefulness. The subjects which have a direct bearing upon the study of medicine are given more space and more prominent place and nonessentials are relegated to minor positions. We hail with delight a physiology that is not a complication of descriptions of machines for making the experiments of the author.

**Modern Surgery.**—By JOHN CHALMERS DACOSTA, M. D. Fifth edition. W. B. Saunders Company, Philadelphia and London, 1907.

The fifth edition of this standard work comes to hand showing many sections altered, corrected, expanded, and much new material added, necessitating an addition of over 200 pages. All the subject-matter has been judiciously selected and carefully brought up to the date of publication. The illustrations are more numerous than before and are well executed. The chapter on diseases and injuries of the abdomen is especially creditable to the author and is thoroughly abreast with the times. In the treatment of joint tuberculosis, he fails to mention the Lorenz method of fixation and weight-bearing, probably because it is too recent and has not been given a thorough trial. The work throughout is noted for its terseness and this together with its many other good qualities makes it an ideal volume for the student and general practitioner.

**Surgical Diagnosis.**—By DANIEL N. EISENDRATH, A. B., M. D. W. B. Saunders Company, Philadelphia and London, 1907.

Eisendrath presents many admirable and noteworthy features in his new work on Surgical Diagnosis. His method of presenting the subject-matter is particularly inviting, all subjects being taken seriatim, beginning with surgical affections of the head, and covering the entire body, excluding the eye, ear, nose, throat and skin. Special attention is given to the methods of examination of various parts of the body before entering into the detail of the pathologic conditions, these being supplemented by excellent illustrations which are a great aid to the peruser. Throughout the volume are found

many tables of differential diagnosis which are always valuable to the busy physician. The closing chapter gives a brief account of the methods of examination of the blood, and the newer methods of diagnosis of renal lesions, while the preceding chapter deals with the important subject of post-operative complications. The index is complete both anatomically and pathologically. The classifications, while not perfect, are so arranged as to make the work nearer the ideal from a clinical standpoint. The numerous illustrations are mostly new and original, and some are beautifully colored. In the 750 pages are found many valuable hints which materially aid in the diagnosis of surgical affections. It is a book which appeals principally to the general practitioner. It has been well edited and superfluous words are infrequent. With these many attractions, together with the author's excellent style, we have no doubt that its position as a standard work will soon be established.

**Postoperative Treatment.**—By **NATHAN CLARKE MORSE, A.B., M.D.** Second edition. P. Blakiston's Son & Co., Philadelphia, 1907.

We agree with the author that too little attention is paid to postoperative treatment, but on the contrary we do not believe that operative procedures are taught too much, as both are essential for a cure in many cases, and should therefore be taught hand in hand. This epitome has many good and excellent qualities. Its popularity and wide circulation is well demonstrated by the appearance of the second edition within one year of the original copy. The author has added the more recent advances, which have been thoroughly tested. The work does not treat exclusively of postoperative treatment, but includes a detailed description of some of the later operations. The additions of especial value are Moorhof's treatment of the tuberculous bone and joint cavities, Mayo on removal of varicose veins, Bloodgood on chyroidectomy, Mayo Robson's postoperative treatment on gallbladder and ducts and Bartlett on postoperative hernia, etc. This volume is particularly desirable to the hospital interne and to those coming in contact with surgical cases. Dr. Morse is to be commended for this valuable addition to surgical literature.

**Gynecology.**—By **E. E. MONTGOMERY, M.D.** Third edition. P. Blakiston's Son & Co., Philadelphia, 1907.

The third edition of Montgomery's monumental work, which represents his many years of valuable experience, has been carefully revised and much of the text has been rewritten. He has added the subjects of Etiology and Blood Examination which are essential and valuable. As in the previous editions, he frequently cites cases as examples of the subject-matter spoken of and this factor, especially, aids in making it an excellent reference book. As a student's book, though rather voluminous, it will be found more than satisfactory. The author's reputation as a diagnostician and operator is amply sufficient to denote the character of this work.

## CORRESPONDENCE.

### THE TESTIMONY OF ALIENISTS.

BY

**FREDERICK A. FENNING, LL. M.,**  
of the Bar of the District of Columbia.

*To the Editor of American Medicine.*—The public press has lately contained a report of remarks made by Dr. Charles W. Burr, of Philadelphia, regarding the testimony of alienists. As a member of the bar I have given much thought to this subject, particularly to the agitation against the present method of obtaining the opinion of experts. The method suggested by Dr. Burr, if he has been correctly reported in the newspapers, is the organization of a board of alienists to examine alike for both the prosecution and the defendant, the members of such board to be paid salaries. This is quite similar, though in my opinion, not so desirable, as the practice obtaining in certain foreign countries, notably Germany, of sending the alleged lunatic to the nearest government hospital for insane, there to be kept under observation for a given period at the expiration of which the hospital experts give their opinion.

The plan of sending patients to a hospital for observation would undoubtedly meet the approval of the members of the medical fraternity, and as regards lawyers and jurymen, I am convinced they would have greater respect for and place a higher valuation on the testimony of an expert formed after weeks or months of daily association. In making this statement, there is no desire to reflect upon the distinguished alienists who in many cases testify with absolute certainty after but one or two short examinations. We all know that many mental disorders show themselves so promptly and to such a marked degree as to render mistakes impossible. It is with reference, however, to those cases of doubt and honest difference, that I wish to emphasize the value of temporary commitment to an unbiased hospital.

Another reform, which has received some attention from the bar associations and medical societies, is the proposed qualification of physicians offering themselves as expert witnesses. The practice of saying that any testimony may be "taken for what it is worth" has grown until it is nothing short of absurdity. The opinion of every physician, who assumes to discuss the mental condition on the witness stand, is accorded weight by the jury. The fact that the witness falls lamentably short of being an expert does not prevent the jury being impressed

by the opinion of such witness, and in weighing such evidence, personal experience has taught, the jury considers that the fact of the witness being a physician warrants extra weight being given to his testimony.

In the District of Columbia, three physicians have testified in the past year giving their opinion as to mental disorders, the qualifications of these alleged experts being as follows: No. 1. Never connected with a hospital for the insane but treated three patients with mental disorder in the five or six years of his practice. No. 2. Treated the insane patients in a small army hospital during Civil war, since which time he has been a general practitioner. No. 3. No hospital experience, graduate of a correspondence medical school, the course being less than two years, and not admitted to practice medicine.

And yet these men, and one other who qualified by saying he was neurologist of a veterinary hospital, were allowed to give testimony "for what it is worth."

We need, in this respect, to exclude the opinion evidence of the "bluffers" of the medical profession. Then the next step should be the creation in each State of a board of examiners to examine every physician who desires to give testimony as an expert. If the applicant passes this board he shall be duly licensed as an expert, and no physician unless he be duly licensed as an expert be admitted to testify as such.

I feel convinced that on the subject of the need of these reforms there is a striking unanimity of opinion among the men of both professions. Changes of great importance come slowly, but with sufficient public demand and the cooperation of the bar associations and medical societies, the changes herein referred to are absolutely certain to come within the early future.

## HYPOTHESIS CONCERNING SOUL SUBSTANCE.

BY

DUNCAN MACDOUGALL, M. D.,  
of Haverhill, Mass.

*To the Editor of American Medicine:* In *American Medicine* for May, 1907, there appeared a criticism by Dr. Augustus P. Clarke on my "Hypothesis Concerning Soul Substance Together with Experimental Evidence of Such Substance" which was published in the April number of *American Medicine*.

In this criticism of my hypothesis Dr. Clarke regrets the neglect of taking temperature records in my experiments, and cites three cases of very high temperature at death recorded by

him, and practically urges the theory that the loss of weight noted in my experiments is easily accounted for by high temperature of the dying bodies.

Now in my cases I have to point out that practically all of them passed away in a state of profound asthenia, with progressive respiratory and circulatory failure, with the cold clammy skin, and the cold feeble stream of respiratory air, so common in those dying of long protracted chronic tuberculosis. As Dr. Clarke urges his theory, it seems entirely inadequate to account for the loss of weight in these cases.

In the first case cited by him, of recorded high temperature, he says: "The patient had then ceased to breathe and the blood was, of course, no longer receiving the cooling effects of the air through the respiratory passages.

"The patient was not weighed, but the sudden mount from 108° to 110° and over by the failure of the blood to receive the cooling influence of the air, would have been deemed quite sufficient to account for the rapid loss of three-fourths of an ounce in weight in an inappreciable lapse of time by insensible transudation of fluid, as must have taken place without doubt in one of the cases reported by the author referred to."

How an insensible transudation of fluid is to account for the rapid loss of weight noted by me the doctor does not say.

In this case he makes the erroneous supposition, that the failure of the blood to receive the cooling effects of the air in respiration is the reason for the rise in temperature noted by him at death, and as the true reason is one that supports my view that the effect of a high temperature at death on the loss of weight is so slight that it may be disregarded, I take issue with him on this point.

*The fact of the matter is, this side effect of respiration which Dr. Clarke makes so much of is so slight as to have little or nothing to do with the temperature of the body.*

According to Claude Bernard and Von Liebig the blood of the right heart is 38.8° C., that of the left heart 38.6° C., and by the time it reaches the aorta it is up again to 38.7° C. Now considering these facts, it is quite evident that the rise from 108° F to 110° F. and over, could not be due to the cause that he assigns.

The fever to begin with, the doctor will no doubt admit, was due to the infection which caused the endocarditis and pericarditis. It was a case, therefore, of bacteremia, or toxemia, or both combined, accompanied by the abnormal destructive metabolism common to such cases, and the sudden rise of temperature

following cessation of respiration is much more easily explained by the *coexisting cardiac failure, the failure of the peripheral circulation, the more or less sudden diminution of blood supply to the skin and the consequent checking of radiation of heat from the skin.*

The fact of the matter is that at death and a little after there is always a rise of the body temperature, due to coagulation of blood and to the chemical changes occurring in the tissues in rigor mortis, but there is a concomitant diminution of heat radiation from the surface of the body due to failure of the peripheral circulation and the consequent emptying of the cutaneous bloodvessels.

In Dr. Clarke's case of strychnin poisoning which he quotes he again falls into the error of exalting the absence of the cooling agency of the air on the blood as respiration fails, and entirely ignores what must have been present, *i. e.*, an accompanying circulatory failure.

He goes on to say: "As the respiration became shallow the temperature by the mouth rose, and as the last sigh was taken and the respiration had ceased, one of the best English thermometer marked the degrees of temperature 109.4°. The surface of the body then seemed relaxed and dry through the internal influences of the great degree of heat within and the absence of the cooling agency on the blood of the air that could no longer enter the respiratory passages."

Now unquestionably in this case of poisoning in which the doctor says the convulsions were frightful, the molar motion of the convulsed muscle set up a tremendous molecular destructive metabolism in the tissues with a consequent evolution of heat, hence the high temperature of 109.4°, but there is no need for supposing that, "the absence of the cooling agency on the blood of the air that could no longer enter the respiratory passages," had any appreciable influence in producing that high temperature. It is much more reasonable to explain the phenomenal temperature by recognizing the convulsions as being the producing factor, and the necessarily accompanying failure, of the peripheral circulation, with the consequent diminished radiating capacity of the skin to be the retaining factor of such a degree of heat in the tissues.

There is still another factor that we must not overlook, as the respirations grow shallower and shallower and finally cease, the fan-like action of the moving air on the buccal mucosa ceases and whatever effect that has in cooling the tested surface is lost.

In one part of his criticism Dr. Clarke says: "Though the internal organs of the body are

poor conductors of heat yet the tissues near the general surface of the body are prone to radiation of heat and to the diffusion of moisture particularly immediately after respiration ceases."

Now as far as this statement concerns the thermal conductivity of the tissues Dr. Clarke is altogether wrong.

Griess and Landois long ago investigated the thermal conductivity of the tissues, and proved the very opposite. To be sure the mucosa of the respiratory tract, and the epidermis, are the tissues finally concerned in radiating the body heat into space, but according to the researches of Griess and Landois the internal tissues of the body are far better conductors of heat than the mucous membranes or the skin.

A practically bloodless skin, such as we meet when patients are moribund, is the worst conductor of all.

Now in regard to the second part of my last quotation from Dr. Clarke in which he asserts that the diffusion of moisture from the surfaces is greater immediately after respiration ceases:

It does not appear to me that the doctor can mean this on serious reflection, because that involves the erroneous conclusion that the loss of respiratory moisture after its carrier, the tidal air has ceased, is greater than when the tidal air is in action with the respiratory movements.

My own experiments showed a progressive diminution of the weight loss due to evaporation of moisture by this channel, the weight lost in the last half hour preceding death becoming proportionately less as the respirations became shallower.

It is here that we come to the milk in the cocoanut of Dr. Clarke's theory.

*If this high temperature theory of the weight loss noted by me means anything at all, it can only have a meaning in relation to the effect of a high temperature or sudden increase of temperature in a body immediately after death causing a more rapid evaporation of moisture from the respiratory passages and from the skin than takes place before death.*

High temperature alone does not account for the loss of weight. A loss of weight implies a loss of substance.

To make the conclusion that a loss of weight from a body is accounted for because a high temperature is registered in it, and heat is being radiated from it, is to abandon the well-proved truth that heat is merely a mode of motion, a form of radiant energy; and to accept again

the long ago exploded belief that heat is a substance.

For Dr. Clarke's high temperature theory to have any validity at all, it must be shown that high temperature in a body immediately after death is capable of causing a greater loss of weight by evaporation of moisture from the radiating surfaces—the respiratory passages and mucosa, and the epidermis, than takes place just before death. How this can be shown in the face of the facts that the carrier of the respiratory moisture—the tidal air—has ceased with the cessation of respiration, and also in the face of the fact that the circulation in the periphery is at an end and the skin is bloodless and no longer secreting moisture, is beyond comprehension.

In my cases, the patients were well blanketed and the sudden loss could not come from evaporation of skin moisture and I certainly fail to see how the sudden loss could come from evaporation of respiratory moisture after the cessation of the tidal air.

It seemed to me that in my cases I took careful note of the weight loss before death. In them the loss by the bladder and bowels was a negligible factor, scarcely any or none at all, and the little remaining moisture kept from rapid evaporation by thick bed clothes. The skin loss was also guarded by the blankets. No rapid evaporation from that surface was possible.

The remaining channels of loss were the buccal cavity and the respiratory passage.

No salivation took place nor loss of any kind from the buccal cavity except what might accompany respiration.

It is quite evident that the bulk of the entire loss noted in the hours before death, varying from three-quarters of an ounce per hour up to an ounce per hour in the different cases was due largely to the respiratory moisture and the difference in weight between the CO<sub>2</sub> given out from the body and the O taken in. In the last 20 or 30 minutes in all the cases this loss diminished quite markedly as the respiration became shallower, and finally when total failure of the respiration and circulation had taken place, a loss of weight took place of such amount and within such a time with all channels of loss closed as to be wholly unaccounted for.

Now my hypothesis of soul substance may be fallacious, but it certainly is not to be pushed aside by this high temperature theory of Dr. Clarke's which does not fit the facts at all and is undoubtedly erroneous.

At the end of the doctor's criticism he makes

the statement that on this matter of immortality we must go by faith and hope only, as science has offered no help favorable to the conception of the idea. Nevertheless, we are bound to two conceptions, either that the death of the physical body is the end of the personality, with all its conscious attributes as memory, knowledge of personal identity etc., in which case all these fine powers we boast of are a mere product of a certain combination of the elements into a certain kind of protoplasm, the protoplasm of the human organism, or in the last analysis the protoplasm of the human brain; and when it dies nature has reached her limit, for the mind dwindles to nonexistence at its death. Or our personality with the varying modes of consciousness, as memory, and knowledge of personal identity, etc., continues to exist after the death of this protoplasmic organism, in which case something is born out of this dead or dying mass of protoplasm and that something according to this conception can be nothing less than the personality of whom we postulate continued existence.

How does this personality continue to exist, in what way, in what manner? As mere will, and idea, and feeling, according to the idealists? Out of all relation to substance; in space, yet not occupying space; having no dimensions; an absolutely nothing, that is yet the greatest something, according to the idealists? Conceive it if you can. If this is the mode of existence there is an end of psychophysics.

Or does the personality continue to exist as a space occupying organism, a substance having the continuation of consciousness and personality for its function, a supersensible substance, related to ordinary matter? If this is the mode of existence, then it is a necessary corollary that it is born out of and set free from the dying or dead protoplasmic organism and so it would follow that there were still some facts in the physiology of death not yet known to us, but capable of being known, making a new field of research to be explored.

### "CONGENITAL FETAL MALFORMATION."

BY

EDWIN TAYLOR SHELLEY, M.D.,

of Atchison, Kansas.

*To the Editor of American Medicine:* In the February number of *American Medicine*, Dr. Chas. S. Barnes has an article with the above title, in which he treats the ancient theory of maternal impressions very indulgently and declares that "some scientific facts remain un-

explained without the admission" that the theory is true. He adds also that "doubtful believers or even disbelievers in the causative effects of maternal impressions think it wise that a pregnant woman avoid violent emotions, unpleasant sights and sounds and all things outside the proprieties of life."

Remarkable as it may seem, these "disbelievers" are even more considerate than he admits they are—they would, if they were able, save from these annoyances not only every pregnant woman but every other woman. And above all they would try to save the pregnant woman from the mental distress occasioned by her belief in the ridiculous superstition that every time she experiences an unpleasant emotion or sight or sound or has a "craving," that she is in danger of "marking" her unborn child.

Let us look at the wellknown anatomic and physiologic relationships between mother and fetus. During the first few weeks of fetal life—when teratologic aberrations originate—the bond of union between the impregnated ovum and the womb is so feeble that, were it not for the practical difficulties involved, the embryo might be transferred to another womb without interrupting its development, as has been done in some of the lower animals.

Whenever this experiment is successfully performed, the transplanted embryo never takes on any of the special characteristics of the "new" mother but retains at birth and thereafter only those of its "original" parents.

Even in the later months of pregnancy the relationship between these two individuals continues to be one of contiguity only, never one of continuity. That is, there are no certain maternal structures continuous with similar fetal structures. Even the blood of the mother and the blood of the fetus mingle only by osmosis of their soluble contents. Between their respective nervous systems—over which maternal impressions would surely have to travel—there is an unbridged chasm as wide as the combined length of the umbilical cord and the thickness of the placenta. By this arrangement, which is physiologically no more intimate than that between the sitting hen and her unhatched chicks, nature surely must succeed in protecting the embryo from any temporary ills, especially nervous disturbances, which may befall the mother.

This arrangement does not, of course, preclude the possibility of the transmission of toxins from the blood of the mother to that of the fetus. Protracted maternal distress and starvation, such as undoubtedly existed during the siege of Paris, might, therefore, quite possibly result

in retarded and defective development of the fetus; but to ascribe such action to "maternal impressions" is to do violence to the usual meaning attributed to that term.

In view of the generally accepted facts of embryology, only a few of which have here been touched upon, how can such a fanciful explanation as the theory of maternal impressions supply be entertained by scientific medical men? Surely they ought to be beyond the *post hoc ergo propter hoc* stage of accounting for the occurrence of unusual natural phenomena.

Every obstetrician knows that the first question usually asked by the mother after the birth of a child is: "Is the baby all right—is it 'marked' in any way?" A little inquiry will soon elicit the fact that she has had a secret fear that something she may have seen, or heard, or touched, or desired during her pregnancy may have marked her baby. And yet how seldom does the coincidence of maternal impression and fetal "mark" take place.

If the power attributed to maternal impressions really exists, why does it assert itself so rarely? Indeed, if it existed at all, would not the history of our race have been disgraced by monstrosity "farms," ever since the illustrious example set by wily old Jacob?

Truth cares nothing for the opinions of the great or the notions and prejudices of the many. One need, therefore, not be overwhelmed by the knowledge that all the obstetric authorities of Philadelphia—so far as I can learn—are maternal impressionists. The theory is taught unreservedly by the obstetricians of its two largest and oldest medical schools. Indeed, there seems to be but one lone "voice crying in the wilderness" against this absurdity—that of Professor Piersol. Is it too presumptuous and chimerical to hope that some day that voice may be understandingly listened to by the conservative physicians of conservative old Philadelphia?

The use of sodium benzoate as a preservative, especially in relation to human health has been considered by the Board of Pure Food and Drug Inspection of the Department of Agriculture. Representatives of the Food Manufacturers' Association urged that if they are not permitted to use benzoate of soda, their business practically will be destroyed. A large part of their business consists of supplying bakers and restaurants with pie fillings, mince meat, pickles, and ketchup all of which they ship in quantities of fifty pounds, or more, articles which are subject to fermentation. The use of the drug was decided against.

## ORIGINAL ARTICLES.

### THE RELATION OF INCORRECT AND CORRECT REFRACTION TO SYSTEMIC DISEASES.

BY

GEO. M. GOULD, M.D.  
of Philadelphia.

All the theories, conservatisms, and exaggerations as regards the systemic results of eyestrain must give way to the teachings and logic of facts. In its last analysis Medicine is almost entirely empiricism. If the facts are true, if the reports are accurately observed, then they will live and destroy all opposing opinions. Upon clinical demonstration, therefore, must be based the proof or disproof of the theory of the systemic results of eyestrain believed in by so many good physicians. These believers are assured that the chief reason why so many other physicians deny the truth is that the adequately painstaking and skilled diagnosis of errors of refraction has been so generally wanting, and consequently the therapeutic results have not occurred. The doubters, deniers, and flouters have not done good refraction work or they would not doubt, deny, or sneer. They who do the will shall know of the doctrine, holds as well in ophthalmology as in ethics and religion. The reporting of cases cured demonstrates, *per se*, the correct testing, proper prescription, and right adjustment of spectacles. Those who say glasses cannot and do not have such effects confess in that their own bad workmanship. Oddly but necessarily such deniers with few exceptions are precisely those who are supposed to be the leaders in ophthalmology, the professorial, visiting-surgeon, text-bookmaking, chairmanship-hunting, "authorities." For a few weeks, as patients came to my office who had passed through the hands of these gentlemen, I took note of the glasses worn, and of who prescribed them, and the following are 50 of the examples found:

1. A man of 50, a famous actor, aged 50, had consulted Prof. A. R., the great English authority, to know if his severe objective vertigo, nausea, etc., might be due to his eyes. He was

given a prescription for reading purposes only, simple spherical lenses, alike in each eye, and so strong that he could not see print beyond a few inches from his eyes. He at once discarded them, and also English ophthalmology. The patient, under mydriasis showed:—

R. + Cyl. 0.25 ax. 45° = 20/20 +  
L. + Sph. 0.25 + Cyl. 0.37 ax. 60° = 20/20 +

Bifocals were ordered, and the giddiness and nausea disappeared.

2. A wellknown physician of New York City recently sent his wife to me. Her family physician had waxed very angry because, by the advice of her husband, she had resolved to come to me. He violently contended nothing was the matter with the eyes, and that her symptoms were all due to systemic disease. He ordered some sort of a liquid to be rubbed on her hand, then to hold the hands in front of the eyes! How the hysterical doctor stupidly diagnoses hysteria when he cannot cure. The woman's eyes had lately been refracted by a prominent oculist of her city and she was wearing, when she arrived, this astonishing correction:—

R. + Sph. 0.75  
L. + Sph. 0.75 + Cyl. 0.25 ax. 180°

(*Par nobile fratrum*, this family physician and the oculist!) These glasses were seen by this ophthalmologist four weeks ago, and pronounced by him "exactly right." Previous to this the patient had worn other glasses from a famous professor of ophthalmology in New York City, but without relief. With the last glasses her headaches, etc., have been growing steadily worse, and continuing every day. The pain is worse in the back of the head and neck. Other symptoms exist, such as drowsiness, absent mindedness, bloodshot eyes, etc. This woman's sufferings could at once have been relieved by:—

R. + Cyl. 0.75 ax. 15°  
L. + Cyl. 0.25 ax. 105°

Why could she not have been able to secure such spectacles in New York City? There are hundreds of thousands of such patients there.

3. In 1901 a young woman came to me wearing in both eyes + Sph. 0.75 + Cyl. 0.25 ax. 90°, prescribed by an oculist of a distant city. The girl had been compelled to leave school because of headache and failing health, anorexia, etc. I found she had the following errors:—

R. + Sph. 2.50 + Cyl. 0.37 ax. 90°  
L. + Sph. 2.00 + Cyl. 0.50 ax. 90°

But I did not give any relief, and was correspondingly appalled, for two years. Then I

learned what a blunderer I had been, because she tilted her head persistently to the right, and her true axis of astigmatism in the right eye was  $75^\circ$ . This led me to the knowledge that the girl had spinal curvature. She soon recovered perfect health and a straight back.

4. A young woman wearing glasses prescribed by an oculist (without drops) had great distress of mind because of tachycardia. The heart action often ran as high (sometimes according to the patient higher) as 122 beats a minute, and irregular. The pulse rate at once became normal under:—

R. + Sph. 0.37 + Cyl. 0.50 ax.  $110^\circ$   
L. + Sph. 0.75 + Cyl. 0.75 ax.  $80^\circ$

For the past year she has had no tachycardia and has enjoyed good health.

5. A western surgeon, 49 years of age, well known as a textbook maker, operator, and teacher, came to me, having "had at least two dozen different glasses from oculist-colleagues." Some of these were as follows:—

1. B. E. + Cyl. 0.75 ax.  $90^\circ$
2. R. + Sph. 0.25 - Cyl. 1.00 ax.  $165^\circ$   
L. + Sph. 0.25 - Cyl. 0.75 ax.  $180^\circ$   
With Prism each eye,  $0.5^\circ$ . Bases out.
3. R. + Sph. 0.25 - Cyl. 1.50 ax.  $165^\circ$ ,  $2^\circ$  Prism B. O.  
L. + Sph. 0.25 - Cyl. 0.75 ax.  $180^\circ$ ,  $2^\circ$  Prism B. O.
4. R. - Sph. 0.25 + Cyl. 0.62 ax.  $90^\circ$   
L. - Sph. 0.25 + Cyl. 0.62 ax.  $90^\circ$   
With 1.75 + Sph. added in right; 1.00 + Sph. added to left, for near-work.

Now if any one of these lenses had been correct the others were incorrect. The fact that the man's severe eyestrain sufferings had continued for a life time ("boring headaches," "neurasthenia," "stagnation of liver," "dyspepsia," "bloodshot eyes," "as if a nail were being driven in between the eyes," "sick-headaches since ten years of age, with nausea and vomiting") and had not been cured by any glasses, showed that none were correct. His error of refraction is:—

R. + Cyl. 0.37 ax.  $45^\circ = 20/20?$   
L. - Cyl. 0.37 ax.  $180^\circ = 20/20 +$   
With perfect muscular balance and presbyopia 1.50.

He has "not had a sick-headache since getting glasses I ordered."

6. A woman of 54 came to me in 1905, wearing, both eyes, + Sph. 1.50, for reading. Nothing was ordered for distance. There has been a life of suffering. Formerly she had "regular sick-headaches, with vomiting." She has been under treatment for liver trouble, or "torpid liver," nausea, feeling of pressure in the

epigastrium, weakness of the limbs, etc. The eyes are often "bloodshot," and "watery." I ordered:—

R. - Sph. 0.25 - Cyl. 0.50 ax.  $90^\circ$   
L. - Sph. 0.50 - Cyl. 1.00 ax.  $90^\circ$  } Distance  
R. + Sph. 1.75 and Cyl. .... } Near ...  
L. + Sph. 1.50 and Cyl. .... } Bifocals

Except slight and occasional indigestion the woman is well. Opera bouffe ophthalmology does not pay—the patient!

7. One of the best known general practitioners of New York City several months ago sent me a woman of 30, wearing, "from a good oculist":—

R. + Sph. 0.25 + Cyl. 1.50 ax.  $90^\circ$   
L. + Cyl. 1.50 ax.  $90^\circ$

She had been wearing glasses for the last ten years, without relief from excruciating and frequent sick-headaches. Reading a little while or riding in a car brings on the headache, so that being compelled to do both she has headache most of the time. She is compelled to take a nap every afternoon. She has much indigestion, a "burning sensation in the throat," pain in the abdomen simulating appendicitis. She is "frightfully nervous," easily excitable, etc. I ordered:—

R. + Cyl. 1.62 ax.  $95^\circ$   
L. + Cyl. 1.50 ax.  $85^\circ$

From the general physician who sent the patient to me I have just received a letter in which he says:—"Mrs. S. came to see me a few days ago. All of her troublesome symptoms have disappeared, and she looks and feels splendidly well." In a high degree of astigmatism the location of the axis by as little as  $5^\circ$  is easy, for the careful oculist, and the failure to get it thus accurately may produce the most wretched misery for the patient. That  $5^\circ$  of error may, indeed, wreck a life.

8. A woman, 36 years of age, came to me in 1904 wearing from a reputable oculist of Delaware, + Sph. 2.50 in each eye. She was suffering from frontal headache, "poor vision," bloodshot eyes, and inability to read, especially in the evening, and constipation. A Colorado oculist had recently testified that her poor vision was due to "an insufficient nerve supply." And this was perhaps true, but if so it was because her errors of refraction and accommodation were not corrected. Upon ordering:

R. + Sph. 3.25 + Cyl. 0.37 ax.  $90^\circ$   
L. + Sph. 2.75 + Cyl. 0.37 ax.  $90^\circ$  } Distance

R. + Sph. 4.00 and Cyl. } Near  
L. + Sph. 3.50 and Cyl. }

her troubles disappeared.

9. A boy, 10 years old, came to me wearing, from a physician in a neighboring city, both eyes, + Sph. 1.00. When no relief came from their use the oculist rightly told the mother he might as well go without them. The mother and boy cannot remember when he did not have headaches. Latterly they have been "regular sick-headaches" with nausea and vomiting about once a week. He often wakes in the morning with headache. The family physician had inherited some antediluvian twist which made him think the fashionable neurologist could or would solve the mystery of the lad's ill-health. There was, therefore, a visit to one of the most famous of the Philadelphian variety. This man, renowned for erudition, had never heard of eyestrain and, poorer in pocketbook, the afflicted parents took the boy back home with the profound advice, "nothing wrong in my line." The error of refraction needing correction was:—

R. + Sph. 0.37 + Cyl. 0.50 ax. 90°  
L. + Sph. 0.75 + Cyl. 0.37 ax. 90°

10. A wellknown oculist of a large Southern city had tried for five years to give a girl of 12 years of age glasses which would bring relief of her symptoms. The patient brought copies of a number of prescriptions ordered during this time. They differ from each other irrec-  
oncilably. The last one reads:—

R. + Sph. 2.00 + Cyl. 0.50 ax. 90°  
L. + Sph. 1.25 + Cyl. 0.50 ax. 90°

But the child was actually wearing spectacles passed upon, so the parent and patient said, as follows:—

B. E. + Sph. 0.75 + Cyl. 0.50 ax. 90°

The little woman "has had headache as long as she can remember;" "the pain is of the entire head, but worst in the temples, with nausea, but no vomiting." Since getting the last glasses in August, 1906, the headaches have been most constant and severe. There is car-sickness, anorexia, blurring of print, bloodshot eyes, styes, watering of eyes whenever she reads, subjective color-sensations. Upon trying to find the error of refraction I found that with the left eye the image of the test letters fades out every few seconds—a bad and significant sign of injured sensation-making mechanism. That eye also has only about 20/30 visual acuteness. The real error of refraction is:—

R. + Sph. 2.00 + Cyl. 0.62 ax. 90° = 20/20 +  
L. + Sph. 0.25 + Cyl. 1.25 ax. 80° = 20/30

Because of the failure to bring relief with the absolutely incorrect glasses the oculist naturally

ascribed the disease to "the period of adolescence!"

11. A woman of 28 had suffered, when she came to me, from "uterine congestion" for eight years and had been under a gynecologist's constant care during this time. Worse than this were the severe headaches. An oculist in a neighboring city recently gave her glasses, = R.—Sph. 0.75, L.—Sph. 0.50. But her error is corrigible only by:—

R. — Sph. 0.62 — Cyl. 0.25 ax. 145°  
L. — Sph. 0.37 — Cyl. 0.37 ax. 25°

Overcorrection of low degrees of myopia, and noncorrection of low degrees of myopic astigmatism is as common as it is health-wrecking.

12. A man 27 years old, came to me, wearing, both eyes, + Sph. 2.50 + Cyl. 1.25 ax. 90°. These glasses were prescribed recently by a physician, an oculist of established reputation in a neighboring city. The patient had been wearing glasses for ten years from the same man. His symptoms have not been bad or severe, but have prevented him from doing the desired amount of study, reading, etc.; they were "nervousness," poor vision, blepharitis, drowsiness, "heartburn," indigestion, constipation, etc. The static error is:—

R. + Sph. 3.50 + Cyl. 1.37 ax. 100° = 20/30  
L. + Sph. 3.25 + Cyl. 1.37 ax. 85° = 20/30

With as high a degree of hyperopia as this, the misplacing of the axes of astigmatism by 5° and 10° is inexcusable on the part of the oculist and the patient must suffer because of it.

13. For ten years a patient, a man 25 years old, has worn from a "leading oculist of his city," both eyes,—Cyl. 0.25 ax. 180°. He has had "severe and constant headaches, pain in his eyes," and other symptoms of eyestrain. Why? Because his static error is:—

R. + Sph. 1.50 + Cyl. 0.62 ax. 90°  
L. + Sph. 1.50 + Cyl. 0.50 ax. 90°

To characterize such ophthalmology properly would be impossible in parliamentary language. Yet such exhibits occur in every good refraction-ist's office almost every day. Yet our "leaders" and textbook makers, and professors, make no move to establish a college or school to deal seriously with the problem.

14. A reputable oculist of New York State, within a month or two, had ordered for a man of 45:—

R. + Sph. 0.50 — Cyl. 2.50 ax. 180°  
L. + Sph. 0.75 — Cyl. 2.50 ax. 180°

The man had been suffering from vertigo, nervousness and restlessness, conjunctivitis, etc. The explanation of his nonrelief is found

in the facts that the foregoing correction was ordered without the use of a cycloplegic (most necessary at this man's age) and that no reading glasses were ordered. The patient was made happy by:—

R. + Sph. 0.25 - Cyl. 2.12 ax. 180° } Dist. }  
L. + Sph. 0.25 - Cyl. 2.12 ax. 15° } Bifocals  
R. and L. + Sph. 1.25 and Cylinders } Near }

15. A professor in one of our Eastern universities was ordered by the chief ophthalmologist of a German university + Sph. 1.00, each eye. His painful eyes, headaches, etc., persisted, and were only relieved by:—

R. + Sph. 0.75 + Cyl. 0.25 ax. 125° } Distance  
L. + Sph. 0.75 + Cyl. 0.25 ax. 105° }

R. + Sph. 1.37 and Cylinders, Reading

16. In 1888 a woman of 47 came to me wearing, from a famous professor of ophthalmology, and his chief assistant (both in collaboration), the following:—

R. - Cyl. 3.00 ax. 20°  
L. - Sph. 3.00

I found that with a - Cyl. 6.00 added in the left eye I gave the woman 20/30? vision, and a useful eye she did not know of before.

17. From a Baltimore authority in ophthalmology a young man got an order for + Sph. 0.75, both eyes, although the correct prescription would have been:—

R. + Sph. 0.50 + Cyl. 0.37 ax. 180°  
L. + Sph. 0.75 + Cyl. 0.25 ax. 180°

Ten series of refractions had given no relief of supraorbital headaches and many other symptoms. One was sufficient when it was correct.

18. A patient came to me wearing:—

R. - Sph. 0.37 - Cyl. 0.12 ax. 180°  
L. - Sph. 0.37 - Cyl. 0.50 ax. 10°

He has had much indigestion, was unable to read, especially at night, was wakeful at night, excitable, etc. His need was for:—

R. + Cyl. 0.75 ax. 100°  
L. - Sph. 0.37 + Cyl. 1.50 ax. 100°

Of course he tilted his head persistently to the left, because he wished to see the things he looked at. And of course he had lateral curvature of the spine. But he was 43 years old.

19. A woman of 52 came to me last year complaining of violent "migraine" or sick-headaches existing since childhood. She has also had pain in the forehead, occiput, back of neck, and in the spine. During the life of intense suffering she has had other related symptoms, depression, palpitation of the heart, etc. For

this condition her Brooklyn oculist gave her, for near-work, in pulpit spectacles, both eyes, + Sph. 2.00. Mrs. Eddy could have done better! The woman's nervous system and health, and great usefulness as a teacher demanded:—

R. + Sph. 0.12 + Cyl. 0.62 ax. 10° } Distance }  
L. + Sph. 0.25 + Cyl. 0.37 ax. 170° } Bifocals  
R. + Sph. 2.50 and Cyl. .... } Near .. }  
L. + Sph. 2.62 and Cyl. .... }

For a peculiar intermediate work + Sph. 1.50 and Cyl., and + Sph. 1.62 and Cyl. were ordered. The former oculist lost his patient, the patient found perfect health, and the second oculist got the unlimited gratitude of the patient whose life of torment had been entirely unnecessary.

20. At the age of 8 a boy had to be taken from school for two years because of chorea, "of the whole body," irritability, etc. Later headaches became troublesome, and dyspepsia. At the age of 15 an ophthalmic surgeon to a dozen hospitals ordered:—

R. - Cyl. 0.50 ax. 180°  
L. + Cyl. 0.37 ax. 180°

The right lens was correct but the left should have been - Sph. 0.50 - Cyl. 0.25 ax. 180°. The blunder could have been worse only if it had been made in the right eye.

21. A wellknown oculist in Philadelphia ordered for a man of 37, for headaches, both eyes, + Sph. 0.75. His refractive error was:—

R. + Sph. 0.75 + Cyl. 0.50 ax. 75° = 20/30 ?  
L. + Sph. 0.62 + Cyl. 0.37 ax. 105° = 20/40 +  
with exophoria.

Deducting + Sph. 0.37, from this, one sees that the overcorrection of hyperopia and the noncorrection of astigmatism, added insult to injury as regards this man's eyes and nervous system.

22. The "best oculist" in a neighboring city, without having used "drops" ordered a man of 25 for both eyes alike, - Cyl. 0.25 ax. 180°. Headaches, severe and constant, pains in the eyes, drowsiness on reading, etc., were the complaints. The man's error of refraction was:—

R. + Sph. 1.50 + Cyl. 0.62 ax. 90°  
L. + Sph. 1.50 + Cyl. 0.50 ax. 90°

Comment is unnecessary!

23. A visiting surgeon to a famed Eye Hospital told a woman of 34 that she had no astigmatism and ordered:—

R. - Sph. 0.50  
L. - Sph. 0.75

She had been confined to sanatoriums and asylums because of ill-health, physical and psychic, characterized chiefly by nervousness and cer-

tain delusions. The above glasses ordered had added to the symptoms "twitching of the eyes." I found the woman had:—

R.—Sph. 0.37—Cyl. 0.37 ax. 105°  
L.—Sph. 0.25—Cyl. 0.50 ax. 60°

This is an error which, in my experience, is as certain as any to upset the nervous system, and even the mental balance. Professors who ignore such errors should be sent to some refraction school—when it is established.

24. For years a little girl's mother had been incessantly trying to get the child to "stop poking her head sideways." She had been "bilious," constipated, and suffered in many ways; she was morbid-minded, irritable, and excessively, even alarmingly, "nervous." There was persistent "batting of her eyes." The New York "Ophthalmic Surgeon" had recently given her, both eyes the same: +Sph. 0.50 +Cyl. 0.75 ax. 90°, and for this piece of scientific work he should have been sued for malpractice. The child's mydriatic error was:

R.+Sph. 0.87+Cyl. 0.25 ax. 75°  
L.+Sph. 0.75+Cyl. 0.37 ax. 75°

The symptoms disappeared, and the child's back is today normally straight and her head held erect.

25. For a dozen years a woman of 28 had been wearing glasses from a physician, a specialist in diseases of the eye. She first consulted him on account of using but one eye, and also for headaches. For seven years she has had severe backache, weakness of the legs, etc. She had sudden "dizzy spells" during which she must lie down. She had great and constant drowsiness. She complained of nervous headaches, "but without pain." (Patients frequently say they have "headaches without any pain in the head," or *vice versa*, that they have "pain in the head without any headaches.") The shame and horror in this case is that the woman's oculist had compelled her to wear the following murderous lenses:—

R. Plano  
L.—Sph. 0.62

I ordered instead these:—

R.+Sph. 0.25+Cyl. 0.25 ax. 60°=20/20+  
L.—Sph. 0.12+Cyl. 0.25 ax. 105°=20/25

The woman had been a life-long headtilter. The left eye was fast going out of function.

26. In 1902 the parents of a young woman, 19, for many years a headtilter, afflicted with headaches, sick-headaches, vomiting, etc., were told by her famous Philadelphia "Ophthalmic Surgeon" that she would before long be insane. But just to lessen the danger he prescribed:—

R.+Cyl. 2.50 ax. 90°  
L.+Sph. 0.50+Cyl. 2.25 ax. 90°

The ophthalmologist's prognosis for the poor girl was perfectly correct—if she had continued under his care! She consulted another, a non-famous advisor, and he ordered:—

R.+Cyl. 5.00 ax. 100°  
L.+Cyl. 4.75 ax. 105°

She has been happy ever since.

27. There is in Philadelphia a great "conservative" much addicted to patient-stealing, surgery, and ordering many "office-visits," who prescribed for a patient, a child of ten years of age, the following:—

R.—Sph. 0.62+Cyl. 3.75 ax. 90°  
L.—Sph. 0.50+Cyl. 3.75 ax. 75°

But the lad's total error of refraction was:—

R.+Sph. 0.75+Cyl. 3.25 ax. 90°  
L.+Sph. 0.75+Cyl. 3.50 ax. 80°

This child was a constant headtilter, had chorea, headache, disordered stomach, etc. It was fortunate for that child that he escaped "scientific treatment."

28. In 1899, a man of 30, suffering from nausea and headache came to me wearing the following, from an eminent author of ophthalmic textbooks, "Ex-President, etc., etc.," "Visiting Ophthalmologist to the etc., etc.":—

Both eyes + Sph. 0.75 + Cyl. 1.00 ax. 90°

But his proper correction was:—

R. + Sph. 0.37 + Cyl. 1.00 ax. 90°  
L. + Cyl. 1.75 ax. 90°

The eminent expert should be compelled to take a course in the New Refraction College to be established—when?

29. From the "best oculist in California" a physician, suffering with frontal headaches, sleepiness, etc., was wearing, both eyes,—Cyl. 0.75 ax. 180°. The optical error of this "Member of the Guild" was, both eyes, + Cyl. 0.75 ax. 90°. Even science and skill will make such blunders when a cycloplegic is not used.

30. From one of Pittsburg's most reputable oculists a surgeon, aged 58, was wearing, both eyes, + Sph. 3.00, but was much troubled with subconjunctival hemorrhages. I ordered:

R.+Sph. 2.75+Cyl. 0.75 ax. 180°  
L.+Sph. 3.50+Cyl. 0.37 ax. 180°  
Sph. +2.50 added for near in bifocals

R. Sph.+3.75 and Cyl. } Operating glasses  
L. Sph.+4.50 and Cyl. }

The hemorrhages disappeared until two years later differences of refraction and accommodation required changes in the lenses.

31. In 1900, a woman of 45 came to me wear-

ing an atrociously wrong pair of glasses. She had had "St. Vitus Dance," all sorts of headaches, much indigestion, etc. Seven years ago she began having seizures of swooning or unconsciousness with "spasms." Two fingers of the left hand have been paresthetic. The "falling fits" latterly have been recurring every two or three days, unless she takes bromids, when they are delayed, and occur about once a week. I ordered:—

R.+Sph. 1.12+Cyl. 0.75 ax. 90°, Prism 2° Base up  
L.+Sph. 1.25+Cyl. 0.50 ax. 90°, Prism 2° Base down  
With Presbyopic correction, in bifocals.

Since the day the glasses were worn there has been but one slight attack of unconsciousness, and the health is good.

32. A man of 38 came to me in 1898 wearing from a great textbookmaker, an ophthalmologist of fame, B. E. + Sph. 1.00. He had had severe frontal headaches, some sick-headaches, and pain between the shoulders. These symptoms disappeared when he began wearing:—

R.+Sph. 1.00+Cyl. 0.37 ax. 165°  
L.+Sph. 0.75+Cyl. 0.62 ax. 180°

33. In 1896 a child of 8 was told by a Philadelphia oculist that no error of refraction existed sufficient to cause the frontal headaches, pain in the back of the neck, and anorexia. The symptoms kept on and grew worse. I found:—

R.+Sph. 0.25+Cyl. 0.37 ax. 35°  
L.+Sph. 0.37+Cyl. 0.37 ax. 145°

and ordered spectacles to be worn all the time. Since then there have been no headaches, no lack of appetite, no neckache. She demands her glasses, wears them all the time, as their disuse at once brings on headache.

34. In the summer of 1904 a young woman of 23 was sent to a sanatorium with "breakdown" or "collapse." All her life she had gone to bed with headache almost every day. She had chorea as a child, and still had it so far as concerned the facial muscles. When the crises of "congestive headache" come on she is so dizzy she cannot see or walk. Her oculists have never demanded that she should wear their glasses *all* the time so she has not done so much of the time, especially when not using her eyes for near-work. She has been under the care of many physicians, especially that of a great New York neurologist. She has taken all sorts of drugs, baths, electricity and—the rest! A prominent Philadelphia oculist recently ordered:—

R.+Sph. 1.62+Cyl. 0.75 ax. 110°  
L.+Sph. 1.62+Cyl. 1.00 ax. 80°

Her proper correction is:—

R.+Sph. 1.75+Cyl. 0.62 ax. 100°  
L.+Sph. 2.00+Cyl. 0.62 ax. 80°

35. A man, 57 years of age, came to me saying "I have been to many oculists but all have refused to give me glasses, or have given me things I could not wear a minute. See if you can help me." The history was of headaches, dyspepsia, and a life of inability to read or write, a life of out-of-doors, every day and all day. Several of the oldest oculists of the city of —, and of the city of —, and of —, did order spectacles but he could not wear them despite all efforts to do so. One had ordered a plano lens in one eye. Several refused to order glasses at all. Dr. —, of B., five years ago ordered: R.—Sph. 0.50—Cyl. 3.50 ax. 30°, L.—Cyl. 4.00 ax. 30°. The man was a head-tilter, had a long spinal S. curve, etc. I found his refraction errors to be:—

R.—Cyl. 5.00 ax. 20°=20/30?  
L.—Cyl. 1.00 ax. 45°=20/30?  
+Sph. 2.50 added for near in bifocals

He has not had a minute of discomfort with these lenses; he immediately regained health. But the most gratifying change is that of his mind, disposition, and actions, which before were morbid, in many distressing ways, but which are now natural and pleasing.

36. These are the last three prescriptions given a man of 53 by the best oculist of his native city in New England:—

R.+Cyl. 2.50 ax 180°  
L.+Sph. 2.50+Cyl. 0.50 ax. 135° } Distance  
+Sph. 2.00 added for near-work

R.+Sph. 2.00+Cyl. 2.50 ax. 80°  
L.+Sph. 4.50+Cyl. 0.50 ax. 135° } Near

R.+Sph. 1.25+Cyl. 2.25 ax. 80°  
L.+Sph. 3.00+Cyl. 0.50 ax. 30°

The correct diagnosis is:—

R.+Sph. 0.75+Cyl. 1.75 ax. 75°=20/30 } Dist.  
L.+Sph. 1.62+Cyl. 2.25 ax. 145°=20/50+ }

R.+Sph. 3.00 and Cyl. } Near  
L.+Sph. 3.50 and Cyl. }  
In bifocals

Is it any wonder the man's troubles were not relieved, and that the left eye was half-ruined?

37. In February, 1904, came to me as perfect an example of physical womanhood as I ever saw, 24 years of age, with a history of severe "migraine" or sick-headaches, keeping up at intervals all her life. Excitement, or menstruation, etc., has been likely to bring on the crises. She had also many other of the common symptoms of "migraine." I ordered B. E. + Cyl. 0.62 ax. 90° and the sick-headaches grew worse. I rerefracted but failed again to give her relief.

Laboratory diagnoses revealed low hemoglobin, but nothing else wrong. Three years passed without further visits and there was still no relief from the migraine. It looked bad for my theory! But during these three years I had learned something about tilted heads and kinked backs. I now found that three years ago I had failed to notice the tilted head of this woman, and so I had not discovered that her right axis was not  $90^\circ$  but was  $105^\circ$ .

38. A man of 56 had suffered from indigestion, flatulence, and constipation since early childhood. Fifteen years ago he had a "general breakdown," "nervous prostration," etc., attributed to "overwork." A few years ago headaches came on, heaviness of eyes, distress in head, etc. Later vomiting, great numbness of the arms, dizziness, and nausea, and great insomnia. He came to me wearing, from one of Philadelphia's prominent oculists:—

R.+Sph. 0.62+Cyl. 0.50 ax.  $90^\circ$   
L.+Sph. 0.37+Cyl. 0.75 ax.  $60^\circ$   
With 2.75 added for near-work.

Now a man of 54 (he was 54 when they were ordered) does not normally have a presbyopic failure of 2.75, and this man did not. He was thus compelled to hold his book within eight inches of his eyes—a source of eyestrain, *per se*. But even at 56 his proper correction was:—

R.+Sph. 0.50+Cyl. 0.37 ax.  $120^\circ$   
L.+Sph. 0.37+Cyl. 0.37 ax.  $90^\circ$   
With +Sph. 2.25 added for near-work, in bifocals.

There is no cure of eyestrain without the absolutely correct location of the axes of astigmatism.

39. From one of Newark, New Jersey's foremost oculists a patient of 67 years of age came to me wearing, B. E., +Sph. 1.25 for distance, and for near +Sph. 3.25. She has worn such glasses as these for 23 years, but for 50 or more years she has been almost a constant sufferer from chronic constipation, severe and almost uninterrupted headache, pain in the eyes, sleeplessness, etc. Can any but "conservative" ophthalmologists, and typical neurologists dream that this woman's half-century of suffering has been useless, has been due, at least in the last 25 years, to ophthalmologic crime, to the lack of correction of this error of refraction:—

R.+Sph. 0.75+Cyl. 1.12 ax.  $180^\circ$   
L.+Sph. 0.62+Cyl. 1.00 ax.  $180^\circ$

with proper presbyopic correction in bifocal spectacles?

40. In October, 1905, a woman of 45 came to me complaining of nausea without apparent cause, frontal headache, car-sickness, "stomach trouble," insomnia, "nervousness," cardiac

palpitation, etc. She had taken nitroglycerin for two years. For some of these things, growing worse, she had worn glasses for 21 years, from a number of oculists, the last prescription being:—

R.—Sph. 4.00—Cyl. 2.00 ax.  $120^\circ$   
L.—Sph. 2.50—Cyl. 0.25 ax.  $180^\circ$   
Exophoria  $4^\circ$

This correction was not far wrong, but no reading glasses were ordered, and especially no bifocals. I ordered:—

R.—Sph. 4.12—Cyl. 2.25 ax.  $110^\circ$  } Dist.  
L.—Sph. 1.87—Cyl. 0.25 ax.  $180^\circ$  }  
R.—Sph. 3.00 and Cyl. .... } Near  
L.—Sph. 0.75 and Cyl. .... }

In a month the woman was "getting fat," and later she was (and continues to be) "practically well."

41. A woman of 38 came to me three years ago wearing:—

B. E.—Sph. 0.12+Cyl. 0.62 ax.  $90^\circ$

from one of Philadelphia's prominent oculists. She had recently begun having severe attacks of "migraine," being kept in bed by them two days, with vomiting. She has had intestinal indigestion "all her life." I found:—

R.+Sph. 0.12+Cyl. 0.75 ax.  $90^\circ=20/20+$   
L.+Sph. 0.12+Cyl. 0.75 ax.  $75^\circ=20/20+$   
Exophoria  $4^\circ$ , Abduction  $8^\circ$ , Adduction  $9^\circ$

Simple cylinders were ordered, and the adduction increased by gymnastic exercises to  $80^\circ$ , with slight esophoria. All symptoms disappeared in a couple of months, there was a gain in weight, and there has since been perfect health.

42. "I can't eat anything, I have such a sick stomach, and I have doctored until I am tired; no glasses have done any good." Thus said a patient, 25 years old, in 1896. I could not get a copy of other prescriptions. I ordered:—

R.—Sph. 0.50+Cyl. 1.50 ax.  $90^\circ$   
L.+Cyl. 1.00 ax.  $90^\circ$

There was immediate cure—all symptoms vanishing at once. Slight symptoms recurred when glasses needed changing, to disappear when the change was made. At the last visit, in 1907, the error was, both eyes +Cyl. 2.00 ax.  $90^\circ$ .

43. A woman, 39 years of age, had vertical and occipital headache for years, worsened by use of eyes at near-range, occasional sick-headaches with both nausea and vomiting, indigestion, neuralgia, melancholy, etc. She had recently been ordered by her oculist:—

R.+Sph. 0.25—Cyl. 0.62 ax.  $180^\circ$   
L.—Cyl. 0.50 ax.  $180^\circ$

I ordered this:—

R.—Sph. 0.12+Cyl. 0.62 ax. 105°  
L.—Sph. 0.25+Cyl. 0.50 ax. 90°

There was so much improvement in all the symptoms that it might almost be pronounced a cure. As this was not completely satisfactory to me, I asked her to return, and I found at this time what I should have found at the first visit, a slight lumbar left curve of the spine, with resultant facts and symptoms.

44. For many years a woman of one of the New England States had been an invalid, surrounded by nurses, and by physicians. To describe the symptoms and long history of illness would take too much space. She had recently been ordered by one oculist:—

R.+Cyl. 0.25 ax. 180°  
L.+Cyl. 0.50 ax. 90°

and by another:—

R.+Sph. 0.25+Cyl. 0.25 ax. 45°  
L.+Sph. 0.25—Cyl. 0.25 ax. 135°

She had, however, the worst sort of ametropia, a low degree of simple myopic astigmatism. I ordered:—

R.—Cyl. 0.25 ax. 150° } Distance  
L.—Cyl. 0.25 ax. 30° }  
B. E.+Sph. 0.50 added } Near

In a month her husband wrote me she “began to improve at once” after getting glasses; “progress is steady and rapid.” “When she takes her glasses off she has flashes of light.” In six months the progress toward health was still gratifying.

45. A famed “ophthalmic surgeon” of New York City last year ordered a woman of 31 to wear:—

B. E.—Cyl. 2.50 ax. 180°

The woman had great suffering of many kinds, and because of troubles in her own family, with supposed inheritance of insanity, etc., was so profoundly depressed that she was frequently on the verge of committing suicide. The gynecologists had done what they could (most of the women who reach the gynecologic operating table have been lifelong sufferers from eyestrain), the nerve men have done what they couldn't, and two tenotomomaniacs demanded permission to cut her ocular muscles. There was, however, need for:—

R.+Sph. 0.25—Cyl. 3.00 ax. 180° } Distance  
L.+Sph. 0.25—Cyl. 3.00 ax. 180° }  
R.+Sph. 0.87 and Cyl. } Near  
L.+Sph. 0.75 and Cyl. }

Her muscles were to be advanced or tenotomized for one degree of exophoria! How many crimes are committed in the name of medical science!

46. A boy of 11 had chorea, headache, blepharitis, and great “nervousness.” His local oculist in a neighboring State ordered:—

R.+Sph. 2.00  
L.+Sph. 2.50+Cyl. 0.25 ax. 90°

I ordered the following:—

R.+Sph. 1.50+Cyl. 1.62 ax. 90°  
L.+Sph. 2.00+Cyl. 1.00 ax. 90°

The chorea had extended to constant spasmodic motions of the right arm and leg. In addition there was stammering, a halting and then explosive method of speaking. All these things disappeared gradually after wearing the last glasses and for the last three or four years have not existed.

47. For a girl 10 years of age, an oculist of Leipzig, Germany, prescribed, according to Continental wisdom, both eyes, +Sph. 1.00, and an American, B. E. +Cyl. 0.25 ax. 9°. The child was constipated, had “bilious attacks” with vomiting, coated tongue, fickle appetite, headaches, etc. As no relief came from the glasses the American ordered their use discontinued. Then to former troubles, temporary strabismus was added, with diplopia. The following in spectacles cured the child of every complaint:—

B. E.+Sph. 0.37+Cyl. 0.37 ax. 90°

48. An ophthalmic surgeon of international reputation in New York City ordered a woman of 24:—

R.+Cyl. 0.25 ax. 90°, Prism 1.5° Base in  
L.+Cyl. 0.25 ax. 90°, Prism 1.5° Base in

The woman's symptoms were frequent headaches, with nausea, since childhood, and great insomnia, extreme nervousness and restlessness. It has been well said that “Happiness is made up of little things, but itself is not a little thing.” It could aptly be said of eyestrain. I ordered for the much and long suffering woman:—

R.+Cyl. 0.37 ax. 90°  
L.+Cyl. 0.25 ax. 105°

Her letters since express “gratitude for the perfect comfort she has had, although using her eyes more than for several years.” A famous orthopedic surgeon discovered spinal curvature soon after she first came to me, and ordered a thick-soled shoe. It hurt her so (pain in the the back) that she took it off and successfully took up gymnastic exercises instead. She

suffers, however, if her glasses get crooked, or if she leaves them off.

49. A Philadelphia oculist ordered, in 1899, for a man of 28 the following:—

R.+Sph. 2.25+Cyl. 1.00 ax. 180° } Distance  
L.+Sph. 2.25+Cyl. 1.00 ax. 90° }

R. Prism 1.5° Base in } Fronts  
L. Prism 2.0° Base in }

The man had pain in eyes, frontal headaches, daytime sleepiness, indigestion, and "nervousness." He had been wearing glasses for 14 years. I at once ordered:—

R.+Sph. 2.00+Cyl. 1.25 ax. 15°  
L.+Sph. 2.00+Cyl. 1.12 ax. 80°

For his esophoria of 18°, and hyperphoria of 3° I did nothing beyond advising the man for awhile not to visit New York. He has had none of the old symptoms since wearing the glasses I ordered. He still has an esophoria of ten or twelve degrees. There is no hyperphoria. I long ago gave him permission to go to New York if he wished to do so. I have another patient with 22° of esophoria, a student and great reader, who is likewise without a symptom.

50. "Deficiency of hydrochloric acid" is often due to eyestrain. This was proved to be true in Mrs. H.'s case, a woman of 33, who consulted me first in 1895. There was also severe indigestion, pain in stomach, inability to read five minutes without bringing on this pain, etc. Sometimes it has been called nervous dyspepsia. The most troublesome of all her symptoms however was a dermatitis, "an eruption," especially of the face, so great as to require "lancing" by a dermatologist of her city. She had been treated in vain for this affection for six months. A general physician who had exceptional observing powers finally told her, despite her glasses from a reputable ophthalmologist, that her skin-trouble was due to her eyestrain. Within two weeks after I had ordered a change of glasses the diseases both of the stomach and skin disappeared. Both returned eight years later when she had neglected to have her glasses changed as I had advised. With new glasses they promptly disappeared once more. The last prescription was:—

R.+Sph. 1.87+Cyl. 0.25 ax. 45° } Distance  
L.+Sph. 2.12+Cyl. 0.25 ax. 135° }  
R.+Sph. 3.00 and Cyl. .... } Bifocals  
L.+Sph. 3.25 and Cyl. .... } Near ... }

Dermatologists are vainly treating many patients which the refractionist could speedily cure.

## THE TRANSVESICAL OPERATION FOR THE RELIEF OF PROSTATISM IN THE AGED MALE.

BY

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The deductions made and the conclusions drawn in this communication are based upon a recent experience in 12 consecutive cases of senile prostatism.

Morbid senile changes in and about the neck of the bladder may be inflammatory, hypertrophic, or atrophic in character, producing an obstruction to the urinary vesical outlet, which is made manifest by a particular train of symptoms, urgent, frequent, and tenesmic attempts at urination, with partial or complete retention. To this the name of prostatism has been applied.

Then, if this be the accepted term, a diagnosis of prostatism is readily made without error from subjective symptoms alone, but to determine in a given case the etiology and gross morbid anatomy may baffle the most skilled diagnostician. It is true that digital examination per rectum will assist in determining the size of the prostate, but the fact that only 30 percent of individuals with enlarged prostate suffer prostatism raises the question whether the hypertrophied prostate alone is the etiologic factor. With the use of steel sounds and the cystoscope, additional information can be obtained. But in a large number of cases the obstruction and irritation are so great that it is impossible to make use of these instruments, and, in many instances when used, the symptoms are temporarily if not permanently exaggerated; consequently we have discontinued urethral instrumentation for diagnostic purposes in all cases that have run the gauntlet of palliative treatment without results.

Further, the development of a third lobe or prostatic bar will produce obstruction to the urinary outlet; and again, contracture of the vesical neck will do the same thing. And that clinician who will attempt to differentiate by digital examination, or urethral instrumentation, will, upon a suprapubic exposure of this

territory, meet many surprises should his experience be a repetition of ours.

Chas. H. Chetwood\* recites a series of mistaken diagnoses (by clever clinicians) conclusively confirmed in suprapubic exposure. We are struck with the notion that most of the writers and surgeons of this country and abroad have confounded contracture of the neck of the bladder and hypertrophy of the prostate. This distinction is vital to the surgeon as well as to the patient, for upon it depends a rational operative procedure.

Contracture of the neck of the bladder without prostatic hypertrophy is capable of producing and does produce prostatism, resulting in morbid conditions in the upper urinary tracts and the termination of life if not relieved. Contracture of the neck of the bladder and hypertrophy of the prostate gland may coexist, and failure to detect this fact and remedy this condition will result in a continuation of the symptoms and progress of the malady.

Writers are at variance as to the frequency of prostatic hypertrophy; some estimate that 34 percent and others 79 percent of all males who reach the age of 60 are thus possessed, yet all agree that only 15 percent who reach this age are sufferers of prostatism.

A chronic posterior urethritis may cause a true contracture of the neck of the bladder with increased elevation of the urethral orifice, accompanied with all the symptoms of prostatism; this may account for the foregoing discrepancy.

After acquainting ourselves with the reported cases, in which operation was done by surgeons of reputation, who in no way have made this distinction, we are constrained to believe that contracture of the neck of the bladder and prostatic hypertrophy have been confused, and operated upon, and reported as the latter. The former is so common in later life that it might well be classed with arcus-senilis and arteriosclerosis as one of the evidences of the blast accompanying declining years.

The most noted anatomical changes associated with prostatism are: (a) bulging of the

posterior surface of the prostate gland; (b) hyperplasia of the posterior commissure; (c) lengthening in and distortion of the prostatic urethra, (sclerosis of the prostate) and, (d) contracture of the neck of the bladder. The condition last named was present in a majority of our cases to a great or less degree. The anatomical changes named are responsible for the fate of the prostatic, *i.e.*, retention, congestion, and inflammation.

Some important anatomic conditions are to be studied in the solution of this surgical question. The prostate gland is composed of two lateral lobes, united by a posterior and an anterior commissure, in which the prostatic urethra is enveloped. The third or middle lobe, prostatic bar and contracture of the neck of the bladder, can be classed together as pathologic in character.

This gland is surrounded by a capsule and held in suspension by the rectovesical fascia which covers all but the vesical surface of the gland, and is known as its fibrous sheath. In the meshes of this sheath are to be found the venous plexus, arteries, nerves, and lymphatics. Thus, it is apparent that an approach to the prostate gland by the transvesical route for the purpose of its enucleation, or any other surgical procedure, can be accomplished without damage to these important systems (arterial, venous, nervous, and lymphatic).

The true sphincter of the bladder is its external sphincter which is composed of voluntary muscles and is situated at the junction of the prostate and membranous urethra, just posterior to the deep layer of the triangular ligament.

Any infrapubic attempt at surgery of the prostate is liable to do permanent injury to the true vesical sphincter, and also to the vascular and nervous systems in this region, and this in no way, may account for the distressing sequels incident to this operation, *i.e.*, incontinence, impotence, and urinary and rectal fistulas, epididymitis, etc.

Our recent experience with the suprapubic operation in 12 cases has yielded the results for which the operation was undertaken; relief of prostatic symptoms, ability to empty the

\*Annals of Surgery, April, 1905.

bladder per urethra, without pain, and the termination of the cystitis without mortality or sequels.

We here submit a brief report of four cases, one each of the different types encountered.

CASE No. 938.—Gentleman of 70 years came into our service in St. Francis Hospital complaining of all the symptoms of prostatism in the most exaggerated degree—urine contained pus, albumin, blood, hyaline and granular casts. Daily quantity of urine voided was from 11 to 17 ounces; bladder capacity was  $2\frac{1}{2}$  ounces. Digital examination per rectum did not reveal much enlargement of the prostate.

He had lived a catheter life more or less for the past three years; had sojourned at different times at Hot Springs, Ark., and various other watering resorts in pursuit of relief, but with no avail.

His physical condition was much reduced; he could not rest or sleep owing to the constant desire and painful efforts to empty the bladder. With failing heart, body and mind, we feared his ability to stand a prostatectomy, and decided upon a suprapubic cystostomy as a temporary operation, and prostatectomy later if he survived the first, and his physical and mental condition should improve sufficiently to warrant it.

On March 15, 1905, under chloroform anesthesia a suprapubic cystostomy was made; the vesical outlet was found to be elevated and contracted; the posterior commissure comprised a thick band of fibrous connective tissue. This band was severed, digital divulsion of the prostatic urethra and true sphincter was done, which then lowered the vesical outlet to the apex of the "Bas-fund," and suprapubic drainage was established; recovery was uneventful.

He was discharged from the hospital April 29, 1905. The suprapubic opening was closed, and he voided his urine per urethra without pain. Bladder capacity 12 ounces. Subsequent report on November 15, 1905, "no return of former condition."

CASE No. 1121.—Gentleman, aged 69, came into our service at St. Francis Hospital, October 20, 1905, complaining of all the symptoms of prostatism; he had been living a catheter life for nearly two years.

Digital examination per rectum revealed a hard atrophic prostate; bladder capacity 4 ounces. Urine contained pus, albumin, and hyaline casts; physical condition good.

Under chloroform anesthesia on October 21, 1905, the vesical outlet was exposed through

a suprapubic incision, and was found to be elevated and contracted. The prostate was small but elongated and densely hard; urethra penetrated its center.

The posterior commissure was incised down to the apex of the "Bas-fund." The portions of the tissue removed by piecemeal did not appear to contain any glandular substance. An attempt to separate the gland from its capsule was, seemingly, impossible. Dilation of the prostatic urethra was made and suprapubic drainage established. Some urine passed per urethra on the eleventh day and practically all on the thirty-fifth day.

CASE No. 1127.—Gentleman came into our service at St. Francis Hospital, aged 65, suffering from complete urinary retention. His physician had been emptying the bladder with a catheter two or three times daily for four days, but failed in every attempt on November 5, 1905, and therefore brought him immediately to the hospital.

He had had repeated attacks of cystitis with retention during the last five years, but always got relief by catheterization. The attacks were coming closer together and during the last year he suffered almost constantly from frequent and painful urination. When seen in St. Francis Hospital, November 5, 1905, at 8 p. m. he was suffering intense pain from an enormously distended bladder.

We were unsuccessful in the attempt at the introduction of a catheter. An anesthesia was at once administered; suprapubic exposure of the neck of the bladder revealed a contracture of its neck and an enlargement of the lateral lobes of the prostate.

The constricting fibrous band was incised, the prostatic urethra digitally divulsed, and the lateral lobes enucleated. The operation was not followed by shock; he was able to leave his bed and walk about the room the next day. Some urine passed per urethra the ninth day. His recovery was interrupted at times by an inability to void the urine per urethra, for a day or two, and then he would have no trouble for several days. When he left the hospital on the forty-first day the suprapubic wound had closed, and he passed his urine per urethra normally.

CASE No. 1135.—Gentleman, aged 81, came into our service in St. Francis Hospital, November 10, 1905.

He had been suffering from prostatic symptoms for two weeks—slight in the beginning but rapidly progressive in character and when seen in the hospital, he had total obstruction.

With difficulty a small catheter No. 9 was introduced, and the bladder emptied and irrigated with a 1 percent carbolic solution. Instructions were given to prepare him immediately for a suprapubic operation.

Four years prior to this the patient came into our service after having suffered from vesical obstruction for five years, with partial and complete retention at times, always relieved with catheter, except in the last attack, when his physician twice resorted to suprapubic puncture.

At this time his physical condition was such that we decided to do a suprapubic cystostomy and establish drainage for temporary relief and later do a perineal prostatectomy, when the thermal reaction had subsided and his physical and mental condition would warrant the attempt. In about 30 days he was voiding his urine normally and without pain. He begged to defer the operation until obstructive symptoms reappeared. To this we consented and he lived almost four years without return of symptoms.

November 11, 1905 a suprapubic prostatectomy was made—a large median and both lateral lobes were enucleated. Urine began to pass per urethra on the ninth day. He was up and about every day after the operation. Urine passed per urethra and without pain and the suprapubic wound closed on the seventeenth day.

It has been our practice to have these patients sit up and walk about their room as early as the third or fourth day, at least they seem for some reason to do better than if kept confined to bed.

*Proceedings of the French Urologic Association.*<sup>1</sup>—Escat presented the results of 410 cases of perineal prostatectomy, with a mortality of 11.3 percent; 8 percent urethroperineal or rectal fistula and 3 percent permanent incontinence. He favors perineal to suprapubic prostatectomy because the mortality of the latter is greater (10 to 15 percent).

Proust collected 813 cases of perineal prostatectomies with a mortality of 7.13 percent. He frankly admits that the suprapubic gives better results than the perineal operation.

Albarran<sup>3</sup> found in 39 perineal operations that the removal of the prostate was easy in 29, difficult in 7, and impossible in 3. He thinks the advantage of the perineal over the suprapubic operation is the lower mortality. He is further inclined to believe however, that im-

provement in the technic of the transvesical operation will reduce the mortality and become the future operation of choice; for, he says, the therapeutic results of the transvesical operation are remarkable.

Furthermore, there are no permanent fistulas, no cicatricial contraction of the neck of the bladder, no injury to the rectum, no loss of sexual power following the operation. The barrier to be considered is solely the greater mortality.

In England the transvesical enucleation of the prostate holds first place and the results obtained by Freyer<sup>2</sup> in his 206 cases in which operation was done, are not to be equaled by any operator, known in literature. In his first report, there were 110 cases with a mortality of 10 percent; in his second report, 60 cases with a mortality of 8.3 percent; while in his last report there were 36 cases with one death, 2.71 percent mortality.

In America, Deaver, Fuller, Lilienthal, Bellfield and Halstead are about the only wellknown surgeons that have declared themselves in favor of the transvesical operation.

It is now conceded, by the ablest advocates of the perineal operation, that the results are far from being equal to that obtained by the transvesical and were it not for the greater mortality in the latter, this would be the operation of choice.

The increased mortality is attributed to the result of infection in the prevesical space. It would be presumptuous on our part to maintain that this is erroneous; however, in 23 suprapubic vesical sections, in our experience, infection in this territory never took place.

*Definite Reasons for the Transvesical Operation.*—1. That prostatism in our experience was due to other cause than hypertrophy of the prostate in 40 percent of cases, and frequently an exact diagnosis cannot be arrived at until after a suprapubic exposure of the vesical neck. 2. That severing the constricting fibrous bands at the neck of the bladder, or dividing the hyperplastic tissue in the posterior commissure (so-called prostatic bar), digital divulsion of the prostatic urethra (thus the vesical outlet is established at the apex of the "Bas-fund"),

establishing efficient drainage and postoperative vesical lavage, are the only essential requirements in a large percent of cases. 3. That the indiscriminate enucleation of the prostate in all cases of prostatism is unnecessary, it adds trauma, and if perineal, disturbs the nerve and vascular supplies, produces hemorrhage, increases shock, prolongs the operative time and may be responsible for increased mortality. 4. That the transvesical approach to the obstructing elements at the vesical outlet (which are practically intravesical) is anatomically indicated and the simpler procedure. The trauma produced is in less complex tissue structures; not followed by the sequels incident to the perineal operation—incontinence, impotence, urinary fistula, etc. Owing to the fact that we can survey every step in the operation by optic, instead of relying on tactile vision—in other words, operating in the light instead of operating in the dark) and thus injury to the true sphincter of the bladder and rectum can be avoided.

In a contribution to the Kansas Medical Society, May, 1905, I raised the following questions: (1) The necessity of an exact diagnosis; (2) the necessity of establishing the vesical outlet at the apex of the "Bas-fund" and, (3) contested the wisdom of the total enucleation of the prostate in all cases of prostatism.

SUMMARY.—1. More conservative and rational operations will yield better results and lower the mortality percent.

2. An exact diagnosis in many cases can only be made upon suprapubic exposure of the vesical outlet.

3. The suprapubic operation can be done with greater definition and will yield better results than the infrapubic in morbid conditions in the male, as has been the case in the female pelvis.

4. The suprapubic route is as rationally indicated for the relief of the foregoing obstructive conditions at the urinary outlet, as it is in vesical calculus.

5. "That the perineal operation offers only 30 percent of cures, with a 71 percent mortality

and a 50 percent chance of having exchanged one urinary difficulty for another, and, not infrequently a lesser for a greater one;"<sup>4</sup> while the transvesical operation entirely relieves all who survive it of their urinary trouble, if due to obstruction in and about the vesical outlet, except when carcinomatous in character, without sequels and with the improved operative technic of today no greater mortality.

#### CONCLUSIONS.

1. The controversy that is now going on relative to perineal and suprapubic prostatectomy, is only a repetition of the one waged when lithotomy was undergoing its evolution. Who today cuts for stone in the male bladder, per perineum?

2. That the most essential thing today is to bring home the facts to the profession in general, first, that prostatism is due to other causes than hypertrophy of the prostate gland; second, that the transvesical operation for prostatism has attained a sufficient degree of perfection to be recommended to this class of pitiable sufferers, with the assurance of a cure if availed of before the inflammatory process has reached the kidney and arrested its functional activity; third, that they should not be submitted to catheterism in the future as they have in the past, until it is hopeless to interfere surgically.

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<sup>3</sup> Annales des malades des genito-urinaires, p. 352.

<sup>4</sup> Journal of Urology, July and Aug., 1905.

### INFLAMMATION OF THE AIR PASSAGES WITHIN THE LUNG.

BY

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The common modes of speech variously name this inflammatory process, but when we stop to consider we must see plainly that no *real* distinction can be made between inflammatory processes which, in truth, differ from each other only in their severity and in the accident of

location. The bronchial system is a system of air tubes and it is the inner surface, the lining membrane of these tubes, which becomes inflamed no matter what word we may use to designate the process. It is easily conceivable that the inflammatory process might include the muscles and the plates of cartilage as well as the epithelium, but it is not because of this extension that we apply the various nomenclature, and indeed, no matter what speculative opinions we may hold, the diagnosis between an inflammatory process involving the epithelium of the bronchi and one involving the deeper tissues as well, the muscles and the cartilaginous plates, is not made by the clinician, nor is it considered in the nomenclature.

The words which we commonly employ, bronchitis, capillary bronchitis, bronchopneumonia, refer not to the severity of the inflammatory process, nor to the depth and importance of the tissues implicated but to the size of the tubes supposed to be assailed and to the supposed involvement of the air cells in the process. That the majority of cases in which autopsy is practised show only superficial inflammatory processes is quite certain; yet from time to time lungs are examined in which the extension of the cultures has, beyond a doubt, caused a consecutive inflammation and even softening of the cartilaginous portions of the tubes; but no symptom has ever been associated diagnostically with this state of the tissues. All the symptoms, all the nomenclature, and practically all the pathology associates itself in our thoughts with the condition of the epithelium, which is perfectly just and right, since so far as our clinical pathology is concerned *the epithelium is the bronchial tube*.

It is fitting also to remember that the circulation of the lungs is peculiar, in that the blood going to nourish the air tubes comes from the bronchial artery and is returned by the corresponding vein. Only a few capillary branchings and may be in a few cases an exceedingly minute vein on the pleural surface, connects with the pulmonary system. The bronchial system, however, ends at the membranous (muscular) bronchiole, the alveolus has no

supply from the bronchial system unless it has been inflamed; in this case it may happen (if the alveolus is not obliterated) that a new system of capillaries has grown connecting the bronchial and pulmonary systems. The systems belonging to both the circulations must increase the number and extent of the capillary loops, but any increase in the number of arterioles and venules, and likewise the supposed possible increase in the number of bronchioles, by the process of growth, must be looked upon as improbable or at least very questionable.

Increase in the capacity of the lung, its growth, is attained by increase in the size of the individualized air cell (alveolar) elements, rather than by augmentation of the number of these elements. The identity and the formality in the arrangement of the bronchial system is easily demonstrated by comparing the bronchial system of a lung from a subject in the second year of life with the bronchial system of an adult subject; the identity in plan of the two lungs is easily established, and in the upper lobe of the adult lung alveoli will almost certainly be found which illustrate step by step the changes through which the functioning portion of both the infantile and adult lung have passed.

If careful examination of the bronchial system is made, the search is nearly always rewarded by finding one or more small bronchi showing evidence of inflammatory changes, in some cases just beginning, in others extended to the condition when "limited areas of bronchopneumonia" seems to be the only formal interpretation of the facts which can possibly be made.

Some of the confusion in respect to the nomenclature can be avoided if we conceive of bronchitis as indicating an inflamed condition of the cartilaginous bronchi, capillary bronchitis an inflammation of the muscular bronchi and bronchopneumonia as expressing the condition when the air cells also are involved. Thus distributed these words do not lack exactness, which they certainly want in ordinary conditions of use.

If we make any attempt to master the relations of causation and extension in this group of disorders, for in no case is either found alone, we recognize in all cases primary and secondary

foci of invasion. In seeking information on this subject, an enormous number of case cards and notes were examined critically and in a number of instances the record contained two chapters, so to say, the case appearing twice, first as a laryngitis and again as bronchitis, and the direct relation between the two admitted of no doubt. The bronchitis had followed the laryngitis because it was caused by it.

It is a curious fact and one full of suggestion that Cohnheim, years before the coccus of Bilothe and Ogston made its appearance on the stage of the things which are, pointed out that when the pus from the inflamed larynx reached the surface of the trachea the spot which it touched became the focus and starting point of a new infection, and that the healing process in lungs which were not known to have bronchitis until examined *postmortem* showed that the inflammatory action propagated itself by direct extension from within outwards, that is, the healing process began at the deeper margin, not at the upper but at the lower margin, and worked upward and outward, that is, its direction of propagation was with the ciliated current, while the infection "*per saltum*" was in the opposite direction and over some considerable space. The small portion of culture on epithelium, or in pus, having been aspirated into the depths of the lung by the air current of inspiration, is enabled by its situation to become a new *focus* for the inflammatory process, and it also becomes another source of infection once it has been able to establish itself. By this process of infection the act of respiration is continually bringing new foci into being, by it the inflammation is enabled to extend itself deeper and yet deeper into the lung, into smaller and ever smaller bronchi, until at last it reaches the muscular bronchus and in this situation it appears as a "capillary bronchitis" or, as is often the case, having reached the alveolus it is the origin of the condition known as "bronchopneumonia." In a word, experience shows us that the superficial influenza which causes the inflammatory disorder, the trifling inflammation of the vocal cords, may by the aspiration of the *materies morbi* become the

almost certainly fatal case of "*bronchopneumonia*" or "*capillary bronchitis*," the name depending upon the length of time between the physician's visits in too many instances.

But whatever is the order of the infection, there can be no dispute about the fact, the only too obvious fact, that this infection really exists, that beginning in the upper air passages, as "a cold in the head" such an inflammation may reach the very depths of the air cells, becoming more and more dangerous as it descends into the *arcana*.

The physicians interested will act according to the best traditions of their art so far as they have any knowledge of what is going on, but the caseated nodule, the nodule of caseated pus, forms the nidus of the tubercle of Koch before the faintest notion of the danger has attracted anyone's attention.

It may well happen, indeed, that this focus is so small that it cannot be detected until the mischief done is shown by the diagnostic symptoms which he who runs may read, by fever, by night-sweats, by cough, and the patient is tuberculized.

On the other hand the focus may include a number of infected bronchioles, the culture may be more than usually dangerous, mischief may follow rapidly by the extension of the inflammation to many *alveoli* at once, and suppuration may become a notable feature. But suppuration once established is sure to spread. Pus loaded with virulent infection elements is carried from bronchus to bronchiole, from bronchiole to alveolus by the act of breathing, and immediately the whole lobule is infected. Inflammation of the supporting tissues and specially of the muscular bronchi causes pressure upon the capillary bloodvessels of the alveolar system and they cease to functionate, and gangrene follows on the inflammatory processes; or the very blood current is made the agent for a widespread septic poisoning. Sometimes the inflammatory process causes the perforation of a bloodvessel of notable size, and a loss of blood which may even put life in peril is the first warning the patient has of the real conditions. Yet all these are but consequences, a series absolutely inevitable, and certain are they from the

instant when the first symptom appeared, and in spite of the so widely current opinion that a "cold" is a trivial thing I am firmly convinced that any cold which includes a process of local suppuration, be the *locus* large or small, is, in fact, the first stage of Cohnheim's "*Phthisis pulmonalis*." This disease, as he pointed out (1878) is: "An obviously acute inflammation, of the intrapulmonary mucous membrane secondary to some inflammatory disturbance of the larynx, a destructive process distinctly, due to the inflammation of the mucous membrane of the bronchi which may go on for a long time previous to the inflammation of the alveoli, which quickly follows, when once the muscular bronchi are invaded, causing a destruction of the lung tissue proper, the cells of the alveoli, and after a loss of blood, which by entering and occluding other lobules, causes death easily and quickly." "This," says Cohnheim, "is the true *Phthisis pulmonalis*, an acute inflammatory disease well known to clinicians, and which is obviously without relationship to tuberculosis." To us who see in the bacillus of Koch the origin of tuberculosis all this is even more clearly a proof of "another origin" than it could possibly have been to Cohnheim. The extreme ease with which the tubercle bacillus infects a lung in this condition, making its culture ground superficially on the pus in the bronchi, and then appearing in the sputum at once and in multitudes, which finding their way only secondarily and by aspiration into the bronchioles and alveoli along with the other figured elements, and thus misleading the diagnostician toward the last, causes the diagnosis of tuberculosis to be made in many cases, but very wrongly. Careful study of many slides made from the tissues of two lungs, one dead of tuberculosis (*Bacillus Koch*), the other dead of the acute inflammatory disease of the muscular bronchi and air vesicles (micrococcus, Bilroth, Ogston, etc.) that is of "*Phthisis pulmonalis*" of Cohnheim, will I believe convince anyone that this "ten weeks' disease" is not in any sense a form of tuberculosis, but a relatively but slightly generalized disorder, truly inflammatory, much less frequently seen than

might be expected, but still seen, much too often.

That it is not more frequently recognized is due to the habit we have formed of calling every case in which the bacillus of Koch is found by the dread name "tuberculosis," and paying too little attention to other symptoms.

The men who have microscopes are frightened by the bacillus, and the men who have none say "tuberculosis," because they see it is the "best card to play," this name takes well with the great world outside.

I have said nothing about the symptoms because all who will read this paper have "Moses and the Prophets" on their bookshelves, and if these cannot teach the diagnosis how can I hope to do so?

But I much wish to add a few words on treatment because I have seen patients recover who had been treated in accord with certain theories when those treated by other methods hastened to their graves. True it is that those who recovered probably died later, or will die later, from tuberculosis, which has established its foothold upon the tissues scarce repaired, tissues weakened by this assault, this inflammatory disorder, which in the beginning had nothing in common with this distinctly secondary disease—the tuberculosis.

That in some mysterious way the intestinal canal plays a part in the process we have been considering, appears to me indisputable for I have seen immense improvement follow the simple clearing out and disinfection of the tissues of the bowels. This in all cases must be the first step. The best method is the use of an effervescent saline, followed by small, but repeated doses of calomel until five or six or if needful more, have been given; a pill containing a single grain is a sufficient dose. When the last dose has been given wait an hour and then wash the intestine clean by giving a large dose of a saline in a very large quantity of water. Personal experience suggests that the dose given be two heaped teaspoonfuls of an effervescent mixture of Epsom salts, such as "Abbott's," in a tumbler of water, a second being given at the end of an hour, or less. This will effectually

empty the bowels, practically it flushes them and generally it causes a decided drop in the temperature, which in many cases is astonishingly high (101.8°-102.3° F.). When the bowel is once empty and clean keep it so with the naphthalin-sugar powders, or sugar-thymol capsules or calcium-iodoform pellets, taking pains not to interfere with digestion. It is an excellent plan to wash out the stomach with a large glass of lemonade about a quarter of an hour before food is given. Lemonade can with advantage be given in large quantities, as it appears to be of use, as if eliminating some poison probably absorbed from the inflamed lung tissues.

In respect to medication directly, not much appears possible, but something can be done, and indirect medication appears to do wonders. The blood comes into such intimate contact with every tissue element in the lungs, and in such amounts that there is justification for very strong opinions on the value of creosote and the bromids. Camphor-monobromid appears to be wonderfully useful, and a few appear to regard this and some such drug as thymol as the most useful aids.

Ammonium bromid is also a favorite drug with many; it certainly lessens the cough, and experience has shown that when no other drug is used at all the fever is very considerably reduced. Aconitin has a great number of advocates, but its usefulness appears to be greatest when the involvement of the lung is least.

The four, emetin, pilocarpin, lobelin and apomorphin, form a group of which it has been said that all that could be done with any group of drugs no matter how numerous could be done with these four. They appear to produce the best results if given in very small and often repeated doses, and the one in use should be frequently changed. The rapid loss of influence (which is sometimes made the subject of remark) is not so much in evidence when they are rapidly alternated; they appear to act by stimulating the muciparous glands of the bronchus and this mucus mechanically engages and thus renders harmless the micrococci by whose virulent action the inflammation is spread. Apomorphin and emetin alternated

appear, in some cases, to excite the secretion of mucus so enormously as to cause a sort of "lavage" and the inspection of the mucus coughed from the lungs, after staining with carbol fuchsin and blue counterstain will give convincing evidence of this utility.

Codein and narcein are the very best remedies for meeting the nervous irritability of the patient in every stage, and in every stage they are useful. Atropin and hyoscyamin appear to give comfort in many cases in which the two opium derivatives fail utterly, but it is of importance to remember that both these alkaloids are stimulants to the respiratory center, especially so is atropin, and sometimes it is well to bear this fact in mind.

With some courage to use the means at hand, if not fearlessly yet not in craven fashion, the physician can often safely say that he has cured his patient, but if the tubercle bacillus appears in the sputum there is very little room for hope; yet in one case, which I saw in 1887 the tubercle bacillus was found plentifully between the fifth and eleventh day, and then they gradually became less frequent until the end of the fifth week. During this week, it was on the thirty-eighth day, I examined ten slides loaded with coccus chains but found no "red worms." By great good luck I was able to trace the probable date and circumstances of the inoculation. This person is still living and has never shown one sign of tuberculosis.

Please accept this caution, while your patient lives it is your duty to fight, but do not forget that the danger of the case depends upon two factors, the virulence of the suppuration coccus and the presence of the tubercle bacillus. If the strain of the coccus is attenuated this disease will amount to "a bad cold;" if virulent you will have a fatal case of "bronchopneumonia;" and tuberculosis is always in the background threatening death.

**Cocain Sales in New York.**—Victory has crowned the efforts of the crusade of local physicians against the sale of cocain. The first drug-gist convicted under the new city ordinance, which provides that the drug shall not be sold without a physician's prescription, was fined \$250.

## FORMATION OF THE FAT GLOBULE OF MILK.

BY

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That the product of glandular activity in some cases is a true secretion by the acinal cells is not questioned. That this drop of secretion, forming within the protoplasm or by the nuclear membrane, can be extruded from the cell as a free liquid, unhampered or unprotected by an encasement of protoplasm or spongioplasm, has received opposing views. If the drop of secretion is covered by a membrane, the coating would of necessity be a part of the protoplasm retained as the droplet is discharged, or else the limiting wall of the drop would be a chemical effect of the subsequent menstrum in which the globule floats. In the former case the ejection of the drop would not be an extrusion of the liquid secretion through a ruptured cell wall, but a constriction of the cell protoplasm. A chemically formed membrane would probably be none other than the known physical phenomenon of the condensation of the edge of a liquid where it comes in contact with a liquid of different density. The absence or presence of a true membranous coating to secreted drops is an important factor affecting the stability of the various drops. Globules of secretion possessing a limiting capsule cannot be united into a mass without a degeneration of that capsule. Received into the animal economy the separate drops cannot be assimilated without a previous digestion of the capsule where it exists. In the absence of a definite membrane the process of digestion becomes more simplified.

The fat of milk is secreted by the protoplasm of the alveolar cells of the mammary gland. Stöhr claims it to result from protoplasmic activity. The drop of oil forms in the cell protoplasm and enlarges until it forms a globular projection covered by a thin layer of protoplasm. The pressure ruptures the thin protoplasmic shell and the globule of oil is extruded into the cavity of the acinus. The ruptured walls of the

cell collapse, and a regeneration of the cell to further activity occurs. The fat globule is not formed by a constriction of the sides of the cell with a division of the protoplasm, which action would necessarily result in the formation of a protoplasmic layer about the fat.

The fat of the globule is in a liquid state, maintaining its shape, equilibrium, and relative position through capillarity, specific gravity, and surface tension, respectively. Floating free in the milk the oil drops are minute spheroids. As they rest upon a surface, as a microscopic slide, they become hyperboloids, as I have visually demonstrated. Pressure upon the coverglass causes these drops to become separated into various pieces which immediately assume the parent shape. Upon freezing, the globules attain irregular shapes, and fracture by pressure into sharp-angled divisions. These droplets of various shapes become globular and spheroidal upon thawing.

Minute drops of liquid when held in suspension undergo a constant revolution of their masses, as expounded by Lord Rayley. This rapid revolution of fat globules I have observed while staining with Bismarc brown or hematoxylin. Particles of insoluble stain, or stained bacteria on the surface of the globule show rapid revolutions of the globule about a slowly changing axis, while there is no advancement of the globule over the microscopic field. The speeds of the revolutions appear to be about four to the second.

The individual milk globules are colorless and transparent, but *en masse* present a translucency or opacity. This is due to light refraction by the spherules. The equilibrium of the globules is due to their specific gravity being but slightly lower than that of the milk serum. The relative positions occupied by the separate fat drops, their inability to coalesce into a single oil mass, is explained wholly by surface tension. When two globules approach each other while in the milk they do not unite, neither do they maintain their former spheroidal shape, but present toward each other adjoining sides as flat facets. Between these facets there is always a thin layer of milk serum, there being

no stainable membrane. Two nonmiscible liquids in contact have at each opposing surface certain tensions. This surface tension is affected by changes in the density of either liquid, whether caused by temperature variations or by a substance being added to one of the liquids. Cream is but a dense aggregation of fat globules, separated from the heavier water by centrifugation or by natural levity. Butter is not a coalescing of the globules but a close approximation permitted by the acid formed by the bacteria and caused by the centrifugal force of churning. It is an agglutination of globules to globules, the globules remaining as distinct drops but in close juxtaposition.

It is hardly probable that each globule is but one variety of fat, the various sized globules consisting of different fats. Osmic acid, which stains different fats to different degrees, gives, with milk globules, the darkest color to the largest globule. This may be due to the fact that the larger globules become impregnated with the greatest amount of the stain.

Normal cow's milk contains between three and five percent fat; cream can be produced to contain 72 percent and butter 86 percent fat. The fat globules average  $\frac{1}{5000}$  inch in size, varying between .01 mm. and .0016 mm. A cubic centimeter of milk contains about 100,000,000 fat globules.

The presence of a capsule of the fat globule is asserted by Dr. Ramsden (Proc. Royal Soc. London, 1901) and others. Dr. Babcock, Leffman, Harris, Fleischmann and Lloyd have not been able to observe a membrane. Richmond explains the phenomenon by a capillary layer; Swithinbank by molecular attraction; Aikman by a liquid envelop; Newman and Szymonowicz by a layer of caseinogen. The results of all their experiments I believe to be attributable to surface tension.

While seeking the peripheral condition of the fat globule, investigators have variously translated the apparent results of two experiments: The formation of the globule upon the addition of ether or of carmine to the milk. After adding ether to milk the presence of large globules is noted; in milk into which the stain is introduced

the fat globules appear to be surrounded by a colored circle.

Storch noted the enlarged globules appearing after the addition of ether. Béchamp maintains that the ether osmoses into the globule, and considers this action sufficient to warrant the acceptance of the presence of a membrane. Employing the oil immersion lens and widely separated fat globules, I could obtain no osmotic action. As the ether flowed beneath the glass it would surround the globules without causing them to enlarge. Globules would attract adjoining drops and readily coalesce with them. In the presence of a small amount of alkali this coalescence was enhanced, and became very rapid, giving the appearance of a sudden enlargement of individual oil drops. As the large globules appeared the number of globules in the whole specimen decreased. There was a coalescence with either reagent, but their joint activity was more marked. They act by overcoming the surface tension. Richmond noted that with frozen globules there are no enlargements caused by ether. Storch intimates that ether in the presence of an alkali dissolves the fat. It is not dissolved by ether, chloroform or an alkali, as noted by Soxhlet.

In milk to which is added ammoniac picromarine the globules are seen to be surrounded by a carmine-colored ring, as observed by Storch. This was supposed to be a stained envelop. Dr. Storch noticed that the intensity of the colored layer is greatest on the side toward the fat globule, the color fading outwardly. Under a high magnification this fading layer is seen to be composed of several rings, their visible number being due to the amount of stain employed, the degree of light and the acuity of vision of the observer. These rings are in reality circles of light refracted from the prismatic edges of the liquid which surrounds the globule, and may be observed around air bubbles in liquids, or around any other small globules of any transparent liquid held in suspension in a nonmiscible menstruum. Prismatic colors are visible. The larger the fat drop the more distinct will the carmine refraction lines appear. Upon adding KOH and ether to coalesce the

globules to large drops of oil the carmine rings become very distinct. If the ether evaporates, the oil mass will separate into small globules, each of which will possess a carmine ring. No free or attached membrane is demonstrable by eosin or basic stains. These actions are evidence that the colored circles are not capsules or membranes surrounding the globules. Moreover, sweet oil, added to skim milk or water, gives similar results.

Fat may be stained by Bismarc brown, as shown upon sectioned dense or frozen adipose tissue. Bismarc brown, added to milk, discolors the serum without affecting the fat globules unless an alkali be added. The alkali, overcoming surface tension, permits the Bismarc brown to act upon the fat, staining it a deep lemon yellow. Sweet oil gives similar results, as do the fat globules of butter. Heating milk or butter does not alter the activity toward the stain, there being no membrane which is destroyed by heat.

Babcock and others have described finding gelatinous shreds in milk under certain conditions. These shreds are usually designated as fibrin. They are stainable by the Weigert method, and also by carbohematoxylin as pointed out by Doane. Milk, upon drying, upon being violently stirred or upon centrifugation yields these fibrinous shreds, much after the manner that blood yields fibrin. Storch believed them to be membranes separated from the fat globules. The fibrin forms in gravity and in separator-cream, but more rapidly and completely in the latter. There is no apparent difference between the fat globules of fresh milk and of separator-cream, but the formation and removal of the fibrin assists churning. Contrary to most opinions, this fibrin has more of a tendency to separate than to unite the globules into masses. After churning, the fibrin remains in the buttermilk, which contains more fibrin than does whole milk or gravity cream.

Other observers maintain that the globules are surrounded by a membrane or layer of albumin, casein, or caseinogen. Whole milk and skim milk contain as much or more of these nitrogenous substances than does the cream

which is composed almost wholly of fat globules. Caseinogen is more abundant in old or in agitated milk than in the fresh product.

The solution of the physics of the fat globules is a question of hydrostatics. The fat exudes from the gland cell as a secretion of drops of liquid oil. The globule has no membranous coating to protect or to hinder it. Resting in the udder the globules levitate to the upper chambers of the cistern, permitting a nearly fat-free milk to be first drawn. Creaming occurs through the forces of specific gravity, the surface tension of the separate globules preventing their coalescence. In the intestines the alkaline menstruum, overcoming surface tension, assists the pancreatic functions of fat splitting destruction. This decomposition becomes necessary to promote assimilation.

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**The Repression of Venereal Diseases.**—An Austrian society has recently been formed. The first meeting, which was largely attended, was held in Vienna on April 25, when the statutes were formally adopted. Addresses were delivered by Professors S. Ehrmann, Adolf Stöhr, and Ernst Finger.

**Leper Asylums.**—There are in Norway no fewer than twenty, but each contains only ten to fifteen beds. They are situated in country places, and the style of living followed in them is similar to that of an ordinary family in moderate circumstances.

## THE LORENZ OPERATION FOR THE BLOOD-LESS REDUCTION OF CONGENITAL HIP DISLOCATION.<sup>1</sup>

BY

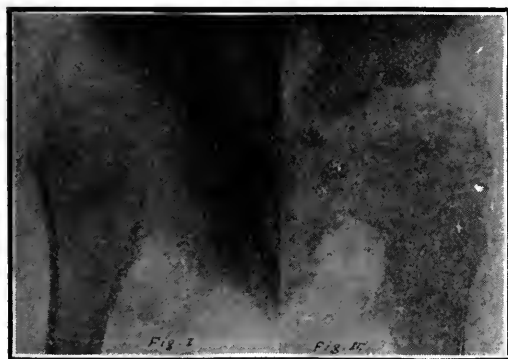
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Of all operations in orthopedic surgery, the most grateful and the most successful, at least at my hands, has been the Lorenz operation for the bloodless reduction of congenital hip dislocation. Held at one time as a cure-all by a frenzied public, it soon fell in the estimation of those who had tried it in this country; but time and ripened experience have proved it the operation of choice for this sad condition.

My experience is as follows:

CASE I.—Girl, aged 11, had a bilateral dislocation operated upon May 3, 1903, during the days of "frenzied operations." Both hips were successfully reduced after using considerable force. Final result, right hip is redislocated, left hip transposed anteriorly under the anterior superior spine where it is held quite stiff. After six months of energetic after-treatment the left

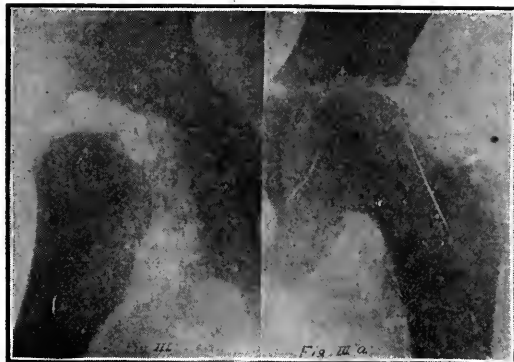


hip became movable and the patient can now walk with a high shoe somewhat better than before operation. Result, failure.

CASE II.—Girl, aged 4, left hip, operation successful. Final result perfect anatomic and functional replacement. Absolutely no difference between the two hips and it is impossible to tell upon inspection which hip has been operated upon.

<sup>1</sup> Read at the annual meeting of the Ohio State Pediatric Society, held in Canton, Ohio, May 8, 1906.

CASE III.—Boy, aged 3, bilateral dislocation, easily reduced. Final result, right hip anatomic replacement, functionally perfect. Left hip transposed to upper edge of acetabulum (Figs. 1 and 2) where the head has hollowed out a firm bony support (nearthrosis). The function of this hip is excellent, motion is not quite as free as on right and there is a slight external rotation of the left limb, but the child runs and plays



with other children without a noticeable limp. He has at this date (three years after operation) 100 times the endurance and is almost as tall as his mother who is suffering from an unreduced bilateral dislocation.

CASE IV.—Boy, aged 6½, bilateral dislocation, operation successful. Final result, excellent anatomic and functional replacement.

CASE V.—Boy, aged 9, left hip. Failed in attempts at reduction.

CASE VI.—Boy, aged 12, left hip, successfully reduced. Final result anterior transposition with very good function.

CASE VII.—Girl, aged 12, left hip. Failed to reduce.

CASE VIII.—Girl, aged 11, right hip. Failed to reduce.

CASE IX.—Girl, aged 9, left hip successfully reduced. Final result anterior transposition, head at upper rim of acetabulum (Fig. 3) with slight external rotation of thigh, no after-treatment, good function.

CASE X.—Girl, aged 8, right hip successfully reduced. Final result, anatomic replacement, head directly in acetabulum (Fig. 4). After-treatment refused, function good.

CASE XI.—Girl, aged 7½, left hip, final result excellent anatomic and functional result. (Fig. 5.)

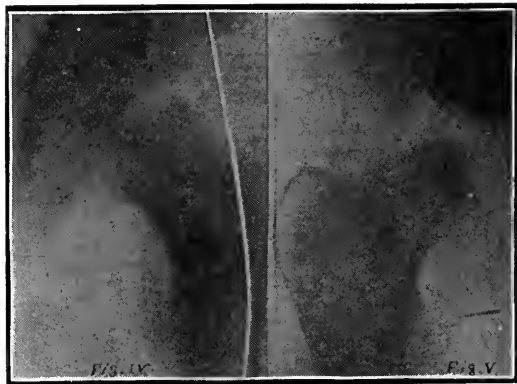
CASE XII.—Girl, aged 4, left hip. Marked anteversion of neck (Fig. 6) successfully reduced. Still under treatment.

In all 12 patients presenting 15 hips for treatment:

Unilateral 9, left hip 7, right hip 2. Male, 4, female, 8.

Bilateral 3-6 hips treated. Failed to reduce, 3. Under treatment, 1.

Hips "available and suitable for statistics," 11. Anatomic cures, 6; perfect functional result, 1; ideal results, 63.3 percent. Good functional results, and transposition with good function, 3.



Redislocation—failure, 1 hip. Untoward results—fractures, paralysis, etc., 0.\*

My results fall below the best figures of today. Clark has reported 100 percent of anatomic cures in his last series, Narath 85 percent in bilateral cases, Hoffa 75 percent in unilateral cases, Heusner 80 percent of all cases, while Bradford, Lovett and Brackett have had 80 percent of anatomic cures in 28 hips operated upon in 1903. The cause for this lies in the advanced ages of most of my patients, only one

\*NOTE.—Since writing the foregoing, Case XII has yielded an ideal result, the head is concentrically located within the acetabulum and the gait is normal without the slightest limp. But the anteversion of the head and neck persists unchanged.

CASE XIII. Girl, aged 6, left hip. Reduction successful.

CASE XIV. Girl, aged 2, bilateral. Reduction successful.

CASE XV. Girl, aged 2, total iliac dislocation of right hip; partial or potential dislocation of left hip. The head of the left hip stands at the extreme upper and outer edge of the acetabulum. The roof of the acetabulum is very oblique and can offer little opposition to the dislocation of the head as soon as the child learns to walk with parallel limbs; at present she walks and stands with the left leg far out in abduction to compensate for the shortening of the right. Reduction successful.

of the bilateral cases being within the proper age limits and only three of my 11 hips available for statistics were presented by children below the age of 6 (Cases II and III). In these three hips I have obtained two anatomic restitutions and one ideal functional result.

Personally, I lay less weight upon the so-called anatomic restitution. Ghillini, of Bologna, who has already operated upon 308 hips denies *in toto* the possibility of ever getting a real "anatomic restitution" and classifies his results only as to function. There is a great deal of truth to his argument, the fundamental deforming forces having usually so changed the configuration of such a dislocated hip that no human force can ever cause it to be "normal." The skiagraphs of my cases all show some abnormality of form still present, such as a mushrooming of the head, change in size, shape and direction of neck, distortion of acetabulum, twisting of shaft, change in shape, size and position of trochanters, etc. Nor does good function always go hand in hand with absolute anatomic results. Case X (anatomic reposition) is not as good functionally as the left hip of Case III (head at upper rim); while in Case IX, Fig. 3, the great trochanter



is engaged in the acetabulum, the head and neck are much like the wart on a pickle and look directly forward; and still the *function is good*, the limb is only slightly in external rotation, the limp has vanished, the lordosis disappeared, the power of locomotion increased to the maximum and the joint is a stable one. Sufficient time, two years, has now elapsed to preclude all possibility of a redislocation. Shall I follow Burgard, Sherman and other opponents of the bloodless reduction and pronounce this case a

failure because the head is not in its proper anatomic place, and advise, as Sherman carried out, a subsequent bloody operation? The *functional* result in this case is good, the parents being so well satisfied that they refuse after-treatment and I feel myself or any one else to be quite unable by means of a bloody operation of any kind to change the shape, size, and direction of the head and neck of this case so as to correspond in any way to the normal side. (Fig. 3a.)

The bloodless operation has succeeded the bloody as the operation of choice for this condition. The latter still has a place in our orthopedic armamentarium—a large place, but it should only be performed after the bloodless operation has repeatedly failed to yield a good functional result.

### SCIRRHUS CANCER SIMULATING HYPERTROPHIC STENOSIS OF THE PYLORUS.

BY

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Mr. K., aged 50, merchant, consulted me on June 3, 1904, and gave the following history:

From a boy he has suffered from attacks of frontal headache which were relieved by drinking warm water and inducing vomiting. A year and a half ago he began to suffer from distress in the epigastrium soon after eating, with bloating and belching and raising of sour fluid which often contained food particles. Nine months ago he had an attack of painless diarrhea which lasted for two months in spite of remedies taken to check it, and for the last seven months he has taken medicine almost continually to prevent the bowels from moving too frequently. He has lost 14 pounds in weight and feels so weak that he is scarcely able to attend to business. His breath is bad and he complains of a bad taste in the morning. His appetite is good but he sleeps badly. On examination, a mass, apparently about an inch in diameter and an inch and a half long, could be felt to the right of and just above the level of the umbilicus. The mass was perfectly smooth, moved freely with respiration, and could be readily moved about with the fingers. There was ischochymia of high degree, for the stomach not only contained food during the day, at a time when it should have been empty, but also in the morning before the patient had

eaten anything. The stomach was much dilated, the lower border extending three inches below the navel. Examination of the stomach content an hour after Ewald's test-meal showed that free hydrochloric was absent and lactic acid present, total acidity 16. The urine contained neither sugar nor albumin, but indican in excess. He was put upon a liquid diet, lavage was practised every morning, and intra-gastric faradization was given three times a week. Under this treatment he steadily improved, and on December 13, 1904, six and a half months after I had first seen him, he ate a test-meal of chicken, mashed potatoes and bread and butter, and in seven hours afterward his stomach was entirely empty. About the first of January, 1905, he was able to take two meals of solid food a day, with liquids between; had gained 14 pounds in weight, felt strong and well, and was able to attend to his business as usual. His stomach in the fasting condition never contained any food as at the beginning of the treatment. I took special pains, however, to impress upon him the absolute necessity of having an operation should he find at any time that his food was again being retained too long in the stomach.

During the first nine months of 1905 he continued taking two meals a day beside liquid food, maintained his strength and weight, and did not suffer from ischochymia. About the first of October, however, his food began to stagnate, and in December he called to see a colleague, as he had done several times during my absence, who strongly recommended operation, but the patient refused. After my return in January, 1906, just three years from the beginning of his illness, he finally consented to submit to a gastroenterostomy which was done by Dr. Buchanan as a forlorn hope, for not even liquids would pass through his pylorus and he had to be nourished by enemas. When the operation was finished he was in fairly good condition, but he did not rally from the shock and died three hours after the operation was completed. A postmortem examination was made; the pylorus was removed, and afterward examined microscopically, when the neoplasm was found to be scirrhous cancer. As there was no history of ulcer in this case, the diagnosis lay between hypertrophic stenosis, a condition first described by Boaz, and carcinoma.

In regard to the history of such cases as this, Einhorn<sup>1</sup> states that cancer of the stomach usually terminates fatally in about one year (not from the time a diagnosis is made but from the commencement of the symptoms). Cases,

however, are met in which the disease runs a more protracted course, 18 months to two years. Long duration of the sickness, two or three years or more, speaks in favor of a benign process, while a short duration, six months or so, rather favors the view of a malignant process. Fenwick<sup>2</sup> says: "In our own series of cases 83 percent died within 12 months, 11 percent between 12 and 18 months, and about 6 percent between 18 months and 2½ years," so that his figures closely agree with those of Lebert, Osler and McCrea, in the main fact that only about 17 percent of all patients survive longer than a year. A tumor at the pylorus, with a large dilation of the stomach, also speaks in favor of a benign stenosis. In cancer of the pylorus the tumor is hard, its surface mostly uneven, sharply defined, and not freely movable. Leube<sup>3</sup> states that it happened in one of his own cases that an apple-sized tumor could be displaced in the abdomen at will. Such a movability in cancer of the stomach seemed impossible to him, but an exploratory incision revealed a carcinoma of the pylorus which was successfully removed. Einhorn<sup>4</sup> reports a case of ischochymia in which a smooth, freely movable, cylindric tumor, the size of an egg, could be palpated, lying just to the right of the navel. The patient was operated on by Dr. Willy Meyer who, on opening the abdomen, found the tumor to be a thickened pylorus, which he removed. "The resected highly thickened and stiff pylorus could not be macroscopically distinguished from a cancerous organ; the microscopic examination, however, showed that it was merely an hypertrophied pylorus." He also reports two cases,<sup>5</sup> both men, aged 36 and 45 years respectively, in which tumors were present with dilation and peristaltic restlessness. In both cases he diagnosed cancer, and recommended operation, which was done. In one case, beside finding a tumor at the pylorus, there were also small whitish infiltrations of the size of a pea in various places in the upper jejunum. This seemed to confirm the diagnosis of cancer. A gastroenterostomy was done, but instead of the patient dying as was expected, he got well, and was still, at the end of eight or nine years, in the best of health. In the other patient, at operation a tumor as large as a fist was found, which was adherent to the surrounding organs. It seemed impossible to extirpate the tumor and so a gastroenterostomy was done. "It seemed to everyone that the patient would soon succumb to the disease. This, however, did not happen. The patient got well, and has remained so up till now, having gained considerably in weight.

As four years have elapsed since the operation, we must assume that the tumor, which clinically and macroscopically showed all evidence of cancer, was not cancer, but something else." Neither is enlargement of the pyloric glands, as pointed out by Fenwick, sufficient to establish a diagnosis of cancer, for enlargement of these glands not infrequently ensues from chronic ulceration of the stomach. A chemical analysis of the stomach content after Ewald's test-meal may be the same in each of the diseases under consideration. In all of Boas' cases of hypertrophic stenosis of the pylorus there was an absence of hydrochloric acid and sarcinae, but lactic acid was present, and when the residuum was not too large the Oppler-Boas bacillus was found. If then the history of the case, the physical and chemical examinations, and even the macroscopic appearance of the tumor itself and enlargement of the pyloric glands are not sufficient to establish a diagnosis with certainty, how can we arrive at a probable diagnosis in such a case as this? Simply by taking into consideration the age of the patient. Before middle life hypertrophic stenosis, due, as Boas believes, to chronic gastritis, after middle life carcinoma.

In regard to the prognosis in cancer of the stomach, Oser of Viennasays the only hope for the patient lies in the fact that the physician may be mistaken in his diagnosis. I think it would be better to say that the only hope lies in an early operation. The difficulty is that patients do not seek medical aid until it is too late. Czerny made the statement many years ago that in cancer of the stomach, when a tumor can be palpated, the case has gone beyond the hope of surgical cure, and the same opinion has very recently been expressed by Brewer. However, taking into consideration the very slow growth of the tumor, this case would have been a very favorable one for operation, and in October, 1905, had a pylorotomy or even a gastroenterostomy been done, his life might have been considerably prolonged. The mortality rate for pylorotomy has been greatly reduced of late years. Mayo, Kocher, and Von Eiseberg report long series of cases with a mortality respectively of 14.5 percent, 16.9 percent and 18.7 percent. Of Kocher's 71 patients 28.2 percent were living at the time of the report, one of them 16½ years after operation. The average time of life for the 20 living patients was 3½ years; 71.8 percent died from one month to six years after operation, the average duration of life being a year and a half. According to Kocher's statistics then, 16.9 percent die as

the result of the operation, and 71.8 percent die on an average of a year and a half after the operation, making altogether a mortality of 88.7 percent. How many of those living at the time the report was made will die subsequently from a return of the disease will have to be ascertained before the total mortality can finally be determined. What conclusion then may be drawn from what has been said about this case?

1. In a case of tumor of the pylorus the only point in favor of, or against cancer may be the age of the patient.

2. The diagnosis in case of a tumor of the pylorus cannot always be made by the aid of an exploratory incision.

3. The nature of a tumor of the pylorus can only be determined by a microscopic examination of the pathologic specimen.

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<sup>2</sup> Fenwick: Cancer and Tumors of the Stomach, p. 226.

<sup>3</sup> Leube's Special Medical Diagnosis, American Edition, p. 281.

<sup>4</sup> Einhorn: D. & S., p. 387.

<sup>5</sup> Einhorn: Further Remarks on Ischochymia and its Treatment, *American Medicine*, June 3, 1905.

## DIGEST OF LITERATURE.

### A REVIEW OF RECENT LITERATURE ON CONTAGIOUS DISEASES.

BY

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#### Scarlet Fever.

*Etiology.*—The exciting cause of scarlet fever is still a fruitful subject for discussion, although some suggestive work has been done along this line within recent years. A number of investigators have been searching for a micrococcus, and Class (N. Y. Med. Rec., Sept., 1899) claims to have isolated a diplococcus, which he believes to be the specific cause of scarlet fever. It possesses characteristics distinguishing it from all other cocci, and the discoverer has found it in the blood, throat, and epidermal scales of patients suffering from this disease. He also claims to have produced a similar disease by inoculation into lower animals. These views have not been substantiated by further investigations. Schamberg and Gildersleeve (*Medicine*, Sept., 1904) found this organism in but 15 out of 100 cases; and regard it as an ordinary coccus. These latter authors look with more favor on

the theories, of Mallory (*Jour. of Med. Research*, 1904, x, 483), who, following the lead of Councilman in smallpox, found protozoan-like bodies in the skin of several scarlet fever cases. These bodies formed a series closely analogous to that seen in the case of the malarial organism. C. W. Duval (*Virchow's Arch.*, clxxix, No. 3, p. 485) confirms Mallory's findings. In blisters produced artificially on the skin of patients, he found four protozoan forms:—(1) An ameba-like form of irregular size and shape, with granular structure; (2) a spherical, segmented form, corresponding to the sporozoite structures of other parasites; (3) a small, oval and comma form, evidently caused by segmentation of (2), and (4) a lightly staining form with a large-meshed network of small fibrils. The etiologic significance of these structures is denied by C. W. Field (*Jour. of Exp. Med.*, 1905, vii, 343) who found them also in vaccine lymph, in measles, in emulsions of tissues and exudates, in antitoxin rashes, etc. He claims that they are part of the protoplasm of the epithelial cells in a state of degeneration. The whole question, therefore, is still *sub judice*.

*Treatment.*—In the absence of any definite knowledge concerning the cause of scarlet fever, all attempts to produce a specific serum against this disease have ended in failure. A number of investigators have proceeded on the theory that it is a streptococcic infection, but the ordinary antistreptococcic serum usually has no influence upon the course of the disease. Some success, however, has attended the use of Moser's polyvalent serum, in the manufacture of which nearly 30 different strains of streptococci are employed. The majority of observers report good results from the use of this serum. These good results apparently arise from the fact that, in severe cases at least, the symptoms of scarlet fever fall under two classes, (1) those due to the specific scarlatinal infection and (2) those due to secondary streptococcic infections, to which the scarlet fever patient seems peculiarly susceptible. Moser's serum acts upon the second class of symptoms, greatly ameliorating or entirely preventing such complications as severe angina, otitis media, endocarditis, pneumonia, sepsis, etc. It is recommended to use the serum as a routine measure in all severe cases. In order to obtain the best results, it should be employed about the second or third day. The only objectionable feature is the frequent occurrence of a serum exanthem, which takes the form of an urticaria or erythema. The dose recommended is from 100 to 200 ccm. Some dissenting voices arise as to the value of Moser's serum,

but the failures seem to be due to its employment too late in the disease, *i. e.* after the fourth day, or to the use of a serum of low potency.

Among other therapeutic suggestions that have been made in reference to scarlet fever, may be noted the red light treatment. Cuoiff (Münch. med. Woch., 1905, No. 32) has had some success in this direction. He claims that the fever disappears by crisis in three to four days, instead of seven to eight days, as ordinarily observed. Complications are not affected by this form of treatment. It is important that all daylight should be rigidly excluded, and that red globes should be used at night.

The prophylaxis and treatment of scarlatinal nephritis have received some attention. Numerous observations within recent years have proved the value of the urinary antiseptic, hexamethylenamin (urotropin, cystogen, etc.), in greatly reducing the incidence and the severity of nephritis in scarlet fever. The drug should be given as a routine measure from the onset of the illness, in doses varying from one to eight grains, once or twice daily. In addition, a copious use of water and a strict adherence to a prolonged milk diet are recommended as prophylactic measures. H. Pater (Presse Médicale, 1906, xiv, No. 40) and other French clinicians recommend salt starvation as a protection against nephritis, the theory being that less work is thus put upon the kidneys.

### Diphtheria.

*Treatment.*—The efficiency of antitoxin in the treatment of diphtheria has come to be regarded by the medical profession as an established fact. In ten years the mortality in diphtheria has been reduced to one-third its former percentage, and there are very few physicians to-day who do not avail themselves of this specific. But it has been demonstrated that, in order to be efficacious, the antitoxin must be administered early in the disease. It has been shown by H. E. Armstrong (quoted in editorial, Lancet, Nov. 4, 1905) that when given on the first day of the disease, the mortality is nil; among those first treated on the second day, it is 5 percent, on the third day it is over 10 percent; and when antitoxin is first given on the fourth day or later, the percentage of deaths rises above 20.

In the course of further study, our ideas as to the dosage of antitoxin have undergone some change, and we now give with impunity much larger quantities than were at first regarded as safe. Severe cases require larger doses than the mild ones, and both require an increased dosage in proportion to the duration of the

infection. It is generally regarded as better to give the whole required dose as early as possible, rather than give it in divided quantities every few hours. A mild case, seen early in a young child, may be given 2,000 to 4,000 units, while an older child requires 5,000 to 6,000. Severe cases should be given 5,000 to 45,000 units, varying with the age of the child and the duration of the disease. Laryngeal infection requires double the dose of a pharyngeal case.

It has been shown also that the later complications of diphtheria are amenable to antitoxin treatment. A pneumonic complication is often due to the activity of the diphtheria bacillus in the lungs; so it is advised to employ antitoxin vigorously, whenever this complication occurs. Comby (Arch. de Med. Euf., Aug., 1906) has repeatedly demonstrated that diphtheric paralysis is benefited by the use of antitoxin, whether the primary disease was so treated or not. Its action in such cases can be readily understood if it be remembered that the paralyzes are probably due to the action of the diphtheria toxin. The dosage should be large and frequently administered.

Bisson (Lancet, Oct. 6, 1906) has given intravenous injection of antitoxin a thorough trial, but his results do not show any improvement over those of the subcutaneous method. The disagreeable results, *i. e.*, urticaria, edema, and arthritis, which frequently follow the use of large and even small, doses of antitoxin, can be prevented, according to C. G. Roehr (Chicago Med. Recorder, Jan. 15, 1905), by the administration of potassium acetate, 5 to 30 grains in a glass of water every hour for two to six days or longer.

In Italy a serum, called the sclavo-Bandi serum, has been produced, which is said to be bactericidal as well as antitoxic. It increases the chemotactic activity of the diphtheria bacilli, promoting the attraction of phagocytes and the ultimate absorption by them of the bacilli. Cortantini (Gazz. d. Osped., Oct. 3, 1905) says that in mild cases local applications of this serum, mixed with tolerized gelatin, are sufficient to effect a cure. In cases of greater severity injections are to be practised. According to Concetti, Gagnoni, and others (Riv. di Clin. Pediat., April and June, 1905), Bandi has produced two serums; one is almost exclusively antibacterial in action, and is adapted for local use, while the serum for purposes of injection is antitoxic as well as antibacterial. These serums have as yet attracted no attention in this country.

*Prophylaxis.*—The use of diphtheria antitoxin

as a prophylactic measure has been widely advocated within recent years, and bids fair shortly to become universal in its application. It seems to be the most effective preventive measure at our disposal. It is not advised, however, that immunizing injections shall wholly take the place of isolation and disinfection. These latter procedures, especially isolation, must still be strictly adhered to. But in conjunction with isolation of the sick, the antitoxic immunization of all persons, who have been exposed to contagion, will aid greatly in preventing the spread of the disease. This has been especially demonstrated in the course of epidemics. Isolation of the patient should be maintained until at least two successive bacterial cultures, made from the secretions of the affected parts, fail to show the diphtheria bacillus. Theoretically, all exposed persons should also be subjected to culture experiments, and the "bacillus carriers" likewise isolated. For the purpose of immunizing these bacillus carriers and rendering them innocuous, it would seem that local applications of the bactericidal Bandi serum might be more efficient than the injection of ordinary antitoxin. The dose recommended for immunizing injections is from 500 to 1,500 units, varying with the age of the subject. The immunity conferred by one dose lasts from three to five weeks, if the individual is not too frequently exposed to the disease. It is stated by P. Sittler (Jahrb. f. Kinderhk., 1906, lxiv, 442) that repeated injections finally lead to a condition of anaphylaxia or hypersusceptibility.

Aramian (Jour. de Méd. de Par., 1903, No. 26, p. 260) and E. Henrotin (Jour. méd. de Brux., 1906, xi, 657) describe the discovery of a new antagonist to the diphtheria bacillus in the form of a vegetable extract. The plant in question is the *Dichondra bræviifolia*, a member of the family of *Convolvulaceæ*, found in New Zealand. It has been shown that a glycerin extract of this plant, called by the trade name "armadiphtherine," has a specific bactericidal action toward the diphtheria bacillus. It is powerless, however, against the diphtheria toxin. Its active principle has not yet been isolated, but the drug is harmless in therapeutic doses. The above authors found it useful as an adjunct to serum therapy. In mild pharyngeal cases armadiphtherine alone will produce a cure. In nasal and laryngeal cases local applications cannot be made with sufficient thoroughness, while in severe pharyngeal cases the general toxemia also requires attention. The remedy is also useful in ridding the affected parts of contagion during convalescence.

## Epidemic Cerebrospinal Meningitis.

*Etiology.*—Although the causal relation of Weichselbaum's *Diplococcus intracellularis* to epidemic cerebrospinal meningitis has been firmly established, there is much obscurity concerning its mode of transmission and portal of entry. Some recent investigations have thrown considerable light on these points. The nasal and pharyngeal secretions have been examined, both from the patients themselves and from individuals in contact with them. Boldnan and Goodwin (Med. News, Dec. 23 and 30, 1905) found the meningococcus in one-half the cases examined during the first week of the disease. They also found it in 10 percent of contact cases. They believe that the contagion is transmitted from the nasal secretion of one individual to another, susceptibility being an important factor in the development of the disease. Horcécka and Poledne (Wien. klin. Woch., 1905 xviii, 1027) found the percentage to be 37.9 in contact cases, and also report the meningococcus present in 12.07 percent of healthy individuals giving no history of contact with the disease. Ostermann (Deut. med. Woch., 1906, No. 11) attributes the carrying of contagion to the occurrence of a meningococcic pharyngitis in many contact cases. If the nasopharynx be examined bacteriologically, the organism will be found still more frequently than in the nose itself. These "coccus carriers" will exhibit no symptoms, or at most a mild pharyngitis, but may readily communicate the organisms to other, more susceptible persons, who will develop the meningitic disease. These facts readily explain the vagaries exhibited in the travels of the infection, which vagaries were formerly considered so strange and peculiar. Westenhoeffer (Berl. klin. Woch., Sept. 24 and Oct. 1, 1906) had excellent opportunities for studying the disease during the recent Upper Silesian epidemic. In every case of acute disease an inflammatory reaction was observed in the pharynx and tonsils; so that it may be said that a meningococcic pharyngitis is always present in the beginning of an attack. In all probability the infection takes place though the respired air, perhaps by droplet infection. Entrance to the meninges is probably effected through the circulation, but it may occur through the lymphatics. The individual disposition appears to depend upon the intactness of the lymphatic system, and the size of the receptacles of infection (tonsils, etc.). It is most likely to develope where there is a large pharyngeal tonsil.

*Prophylaxis.*—In view of these recent investigations concerning the spread of cerebrospinal

meningitis, it has become possible to formulate more definite prophylactic rules. Isolation of the patient and disinfection of discharges from the nose and mouth, together with disinfection of the bedding and personal clothing, are the most important measures. It is equally important, however, to examine the nasopharyngeal secretions of those who have been in intimate relation with the patient, and to isolate and treat locally those persons who show the presence of the meningococcus.

*Treatment.*—As yet no specific for this dread disease has been found. Repeated lumbar puncture is advocated and practiced by Lenhartz (Münch. med. Woch., 1905, lii, No. 12) and others, especially when there are marked pressure symptoms. Franca (Deut. med. Woch. xxxi, No. 20) recommends the withdrawal of 25-50 ccm. cerebrospinal fluid, followed by the injection of 3-18 ccm. of a 1 percent solution of lysol, this process being repeated daily until the cerebrospinal fluid is sterile. The purely empirical use of diphtheria antitoxin has been weighed in the balance and found wanting, although still advocated by a few observers. F. Huber (Med. News, April 15, 1905) reported success with the antitoxin if given early, before anatomic changes have occurred; he gives one to four doses of 1,500 to 2,000 units each, but finds that the malignant type is unaffected by this treatment. E. Waltzfelder (Med. Record. Mch. 11, 1905) on the other hand gets the best results in cases where profound constitutional infection exists, but he uses 6,000 to 10,000 units daily. Peabody (Med. Record, May 13, 1905) and Osborne (N. Y. Med. Journal, Feb. 17, 1906) condemn its use. The latter author, as well as C. Chase (Brooklyn Med. Jour., Nov., 1904) speaks highly of ergot, given by mouth, hypodermically, or intramuscularly, every one to six hours until the symptoms subside. Osborne also gives morphin, and applies ice bags to the head and spine. Kallmeyer (Deut. med. Woch., xxxi, No. 16) places his reliance upon a modification of Aufrecht's hot bath treatment.

Rubemann (Berl. klin. Woch., 1905, No. 18, p. 541) recommends the use of sodium iodate. This salt differs from the iodids, in that it gives up all its iodine in a relatively short time. It can be given in doses a little below those of potassium iodid, and may be administered by mouth or subcutaneously, the latter being recommended for severe cases. Edlefsen (Berl. klin. Woch., 1906, No. 5) endorses these statements, and has especially noticed a paucity of sequels in cases that have been cured by the use of sodium iodate. Westenhoeffer (Berl. klin.

Woch., Sept. 24 and Oct. 1, 1906) advises trephining early in the course of the disease, to avoid the development of hydrocephalus. An incision of the atlanto occipital ligament permits of a simultaneous opening of the subarachnoid space and the cranial cavity, in such a way that the third and fourth ventricles can be drained directly through the foramen of Magendie. To prevent hydrocephalus this incision should be made about the middle or end of the second week. Flexner (Jour. Am. Med. Asso., Aug. 25, 1906) has experimented in the production of an antiserum in some of the lower animals. Although no practical results have as yet been attained, the experiments were very encouraging. The serum, when obtained, will probably have to be in such form that it can be injected into the spinal canal without danger.

### Whoopingcough.

*Etiology.*—Several investigators have independently found an organism, which must be regarded as the cause of whoopingcough, in view of its agglutination reactions. P. Reyher (Jahrb. f. Kinderhk., lviii, p. 605) found in all of 34 cases a bacillus resembling the *B. influenza*, but of somewhat larger size, and having certain peculiarities of growth. The bacillus was found in the sputum, and in the trachea and larynx of nine section cases. M. Wollestein (Jour. of Exp. Med., July, 1905, p. 335) differentiated the organism from the bacillus of influenza by means of agglutination reactions with the blood of pertussis patients and of immunized laboratory animals. Bordet and Gengon (Am. de l'Inst. Pasteur, xx, No. 9) have carried experiments along the same line, and are now working to produce an effective serum for treatment or immunization. The organism, found by these several investigators, is probably identical with the one described by Spengler in 1897 and by Jochmann and Krause in 1901, and called *b. pertussis* Eppendorf by these authors. Czaplewski and Hensel, in 1897, also saw this bacillus, but lost it in the course of culturing, the one which they claimed as the cause of whoopingcough being a small, poled bacillus. The *B. pertussis* is slightly larger than the influenza bacillus, and resembles the latter in growing, only on hemoglobin-containing media. It is short, plump, ovoid, with rounded ends, and is Gram negative. On blood agar it grows in small, transparent, dew-drop colonies. It is nonmotile.

*Diagnosis.*—F. S. Churchill (Jour. Am. Med. Asso., 1906, xlv, 1506) found a general leukocytosis in almost all cases of whooping-

cough, also a lymphocytosis in 85 percent of cases at some time during the course of the disease, and in over 90 percent of cases in the early catarrhal stage. He considers the presence of a lymphocytosis in a child with hard, persistent cough, a point of great diagnostic value. It is also of use in prophylaxis, as prompt isolation can be practised. The child's age must be taken into account, in estimating the importance of the lymphocyte percentage.

**Treatment.**—The search for a specific remedy for pertussis still continues in vain. An anti-toxic serum may be evolved shortly, but in the meantime we must depend upon purely empirical therapy. F. W. Kilmer (Jour. Am. Med. Asso., 1904, XLIII, 1749, and Arch. of Ped., Feb., 1907) recommends an elastic abdominal belt to prevent excessive vomiting. It is especially useful in infants and very young children, the author claiming a reduction of 85 to 95 percent in the vomiting spells. As described in the more recent paper, the belt is made of linen, with a strip of silk elastic webbing, two inches wide, inserted on either side. The belt laces in the back, and the degree of constriction may be varied by the lacings. The length of the belt should be three inches less than the circumference of the abdomen at the umbilicus, and it should extend from the axillæ to the pubes. It is applied over the undershirt.

H. de Rothschild (Le Bulletin Méd., May 23, 1906) accidentally found that chloroform narcosis, induced for a surgical purpose, abruptly terminated an attack of pertussis in a child on the eighth day of the disease. Further experiments in this line included nine patients. Two were immediately cured. In four cases the frequency of attacks was at once greatly diminished, to disappear entirely on the fourth day. In three cases the cure was complete within 15 days. The duration of the chloroform administration was five minutes; merely muscular relaxation, and not complete anesthesia, was attempted. In no case was it thought necessary to repeat the administration. The author reports having found a similar observation by Rehfeld in 1895. Nauwclaer (Bull. Med., Oct. 3, 1906, p. 861) reports six cases, in some of which an amelioration was observed, but it never attained the astonishing results of Rothschild.

Bromoform has had its day, and now fluorin and its derivatives are coming into vogue. Antitussin is an ointment containing 5 parts difluordiphenyl, 10 parts vaselin, and 85 parts wool fat. One dram is to be rubbed into the neck, chest and back, after washing the skin with

soap and water. It has been in use several years, being highly recommended by numerous German authors, among the more recent of whom may be mentioned Swoboda (Wien. klin. Rundschau, xviii, No. 23, p. 416) and Rahner (Münch. med. Woch., lii, No. 25, p. 1198). Stepp (Therap. Monatshefte, Nov., 1904, p. 549) claims to have had astonishing results with fluoroform, which produces immediate amelioration, and greatly abbreviates the duration of the disease. A 2-2½ percent solution in water is used, one to four drams being given every hour. It is tasteless, odorless and non-poisonous, but very expensive.

### Measles.

**Etiology.**—R. C. Rosenberger (Tr. Path. soc. Phila., 1906, n. s. ix, 109), upon blistering the skin and examining the serum, found a more or less constant hyaline body. It varied in size from one-tenth to one-sixth the diameter of a red blood cell. The hyaline body had attached to it a granule of brownish-black color, which was actively motile. Flagella were occasionally seen. Another hyaline body, containing from two to four small motile granules, was also seen. The first described body was observed in 39 out of 41 cases of measles; in the two unsuccessful cases the serum was examined on the fifth day of the eruption, when it was fading. Attempts at culture were unsuccessful. The characteristics of this body seem to the author sufficiently constant to class it among the cytocytes, and its almost invariable presence in the serum of the early eruption suggests an etiologic relation, although the evidence is by no means conclusive.

**Symptomatology.**—L. Merk (Zeit. f. Heil., 1905, xxvi, 579) describes two cases of measles without eruption, basing his diagnosis on the presence of the infection in other members of the family, the presence of bronchitis, a rather characteristic temperature curve, and the occurrence of a postmorbillous urticaria similar to that observed in other wellmarked cases of measles in the same family. Cases of measles without exanthem have been reported before, but often the claim is not well substantiated. Leach (Lancet, Dec. 23, 1905) reports four cases of relapse in measles in an epidemic of 262 cases. In all four cases the relapse repeated in all particulars an ordinary attack of the disease. J. D. Rolleston (Brit. Med. Jour., Feb. 4, 1905) describes prodromal rashes in measles, occurring on the first and second days. They are evanescent, local in occurrence, and polymorphous, consisting of isolated macules,

blotchy erythema, papules, urticaria, scarlatiniform erythema, and circinate erythema.

*Epidemiology.*—Kerr (Brit. Med. Jour., Jan. 27, 1906) has made an exhaustive study, extending over five years, concerning the possibility of controlling the spread of measles among school children. It was found that the disease spreads in classes under five years of age, except in certain better-class schools. The importance of knowing the proportion of susceptible children in a class is very great; for it has been found that measles tends to appear whenever a class accumulates from 30 to 40 percent susceptible members, and continues to spread until this proportion falls to 15 or 20 percent. The spread of the epidemic is greatly affected by the hygienic conditions of the school, especially the ventilation and crowding. Closure of the school or of the affected classes does no good, unless done upon the appearance of the first case. It is suggested that, whenever a case of measles appears in a class, circulars should be sent to the parents of nonimmune children, advising them to look out for colds and to keep the child at home upon the appearance of the first symptoms. In classes above the lowest it is not necessary to exclude well children, living in infected houses. Heissler (Münch. med. Woch., 1905, No. 28) has studied an epidemic of almost 3,000 cases, and also concludes that closure of schools or classes is of no use in suppressing epidemics.

*Treatment.*—Owing to the generally benign character of measles, little attention has been paid to its specific treatment. In line with the investigations concerning the effect of red light on other exanthems, P. Alté's (abstracted in Centralbl. f. Kinderh., 1906, No. 4, p. 148) found that red light treatment shortens the duration of measles, lessens the likelihood of complications, and diminishes the severity of the symptoms.

### Mumps.

*Diagnosis.*—The differential diagnosis of mumps from lymphatic enlargement is often difficult in the first stages, especially where the mumps only involves the submaxillary or sublingual glands. I. S. Wile (Arch. of Pediat., Sept., 1906) claims that this diagnosis may be made readily by a differential count of the leukocytes. The diagnostic feature is a relative and absolute lymphocytosis, the polynuclear neutrophiles being correspondingly diminished. The lymphocytosis is more marked in bilateral involvement than in unilateral disease. With orchitic complications the polynuclear neutro-

philes tend to increase relatively, although there may be no absolute leukocytosis. Hyperleukocytosis occurs in mumps, but is not of high degree. In cervical adenitis there is usually a leukocytosis but the increase affects especially the polynuclear neutrophiles.

## RECENT EDITORIAL OPINIONS.

**The Journal of the American Medical Association.**—"VITAL ACTION" OF CELLS IN THE LIGHT OF [MODERN RESEARCHES: Recent investigations seem to indicate that the so-called vital activities of cells are merely the result of natural and well-known forces acting according to common laws but which seem mysterious because the processes occur under complex conditions. It has been shown that the activities of living cells are due to intracellular enzymes and that they act according to simple laws of physical chemistry quite the same as the strictly inorganic catalyzers. Croft Hill, in 1899, and Kastle and Loevenhart, in 1901, demonstrated the fact that certain enzymes had the power not only of breaking down complex substances but also of combining simple substances to form complex ones. In 1904 Taylor, of California, conclusively proved that the vital action of cells is not essential for the successful synthesis of protein through the agency formation of fats. Taylor has recently reported a of a trypsin obtained from a marine mollusc, thus showing that the formation of proteins can be accomplished by the same enzymes which ordinarily disintegrate them. This process probably occurs in the body and does not differ in principle from the most simple synthetic processes of the chemical laboratory.—THE SHIP SURGEON: For internes just finishing their hospital service and before entering on active practice or for students just graduating and before beginning their hospital service the position of ship surgeon is ideal. For such a position a man must be well equipped with medical knowledge, as he is the only medical authority on board and he has all the responsibility of such authority. Apart from professional matters such a position gives him time for recreation, opportunities for expanding his views of life by visiting other countries and cities and by meeting cultivated men and women on board. The position of ship surgeon, however, is not recommended as a life career for an active, live man.—PROTECTING THE FOOL FROM HIS FOLLY: The question has recently been asked whether the campaign against the nostrum evil had not,

from an educative standpoint, reached its limit. It seems really to have only begun. Laws must be made and properly enforced which can only be brought about by public opinion, the result of education. The physician must from his peculiar position and special knowledge take initiative. The public press seems to be awakening and may soon be counted on to throw its influence on the right side. The proper moment seems to have arrived for the medical profession to take an active part in this campaign against the nostrum evil and quackery.—SEWAGE AIR INFECTION: It is not usually thought that bacteria are liable to escape and be carried through the house pipes from a well-arranged sewage system. N. H. Horrocks recently showed that not only could bacteria be liberated from the bursting of bubbles of fresh sewage and be carried considerable distances by air currents and that these same air currents could also liberate and convey germs that had dried on the surface of pipes, but he also showed that typhoid bacilli could be given out by fresh sewage flowing through a well-drained sewer independently of bubbles and the separation of dried particles from the walls. Sewer emanations, therefore, must be looked upon as the occasional cause of mysterious outbreaks of disease.—ACUTE PANCREATITIS: The etiology of this condition may be said to be still in doubt. The causative factors may be divided into three groups, (1) obstruction of the biliary or pancreatic ducts with retroinjection of secretion, (2) infection from gastrointestinal tract, (3) traumatism. Fat necrosis and glycosuria are not common complications. Dr. Anfin Egdahl, after an analysis of 105 cases from the literature and two of his own, concludes that gallstones are the cause of acute pancreatitis in 42 percent of cases and gastrointestinal disorders the cause in 30 percent of cases. The organism most commonly present was *Bacillus coli communis*, streptococci and staphylococci occurring next in frequency. Typhoid fever of the acute febrile diseases was the most common antecedent.—THE BLOOD-PRESSURE IN RENAL TUBERCULOSIS: In most forms of nephritis especially of the chronic type the blood-pressure is increased. Reitter has recently found that in individuals with renal tuberculosis there is practically, without exception, a hypotonia. A rise of pressure was not present in all cases of pyelitis and pyelonephritis but in none of these cases was there an absolute hypotonia.—GONORRHEA AND VERTEBRAL RHEUMATISM: Bouchard has recently described a form of spinal arthropathy of chronic nature, usually mild though it may be

severe in its manifestations, and then constitutes the so-called "*Spondylose rhizmèlique*" of Marie. It usually attacks one segment of the spinal column, the lumbar, dorsal or cervical, and is characterized by limitation of movement going on to ankylosis, deformity of the spine and at times the formation of osteophytes. The condition is often classified as arthritis deformans. Bouchard claims that such cases are gonorrhæal in origin and may develop years after an acute attack where there is an old focus of chronic inflammation in the prostate or vesiculæ seminales.—THE DIAGNOSIS OF SYPHILIS BY SERUM REACTIONS: The reaction known as "deviation of the complement" has been used as a method of diagnosis in various diseases. Its application to the diagnosis of syphilis has been retarded owing to the difficulty in isolating the specific organism. This difficulty has now been overcome, first by the observation of Wassermann and Bruck that the tissues and body fluids of tuberculous individuals contain sufficient amounts of the bacterial substance to permit of their use in carrying out the reaction for tuberculosis, and then in association with Neisser that the tissues of fetuses with congenital syphilis contain enough of the substance of *Treponema pallidum* to give the reaction for syphilis. The reaction has been used in some of the German hospitals with great success. It requires, however, the services of men experienced in the finest details of serum research and the facilities permitting the obtaining of fresh syphilitic fetuses at frequent intervals.—THE TRANSMISSION OF MEDITERRANEAN FEVER: The recent report of a British Government Commission shows that *Micrococcus melitensis*, the cause of Mediterranean fever, leaves the body by the urine and also by the milk. The breath, saliva and sweat do not contain the organism and it is doubtful if it is present in the feces. The organism is given off in the milk not only of human beings but also of goats and it is probably through this latter medium that the disease is transmitted, for in the localities where it is present the milk of goats is largely used as a beverage. The danger to this country lies in the fact that goats are imported here from the Mediterranean countries, though infection here would be unlikely as Americans do not use goats' milk for drinking purposes. The common house-fly, however, might be influential in the transmission of the organism.—DEATHS IN POLICE STATIONS: The recent death of a young and well-thought-of physician in the cell of a police station in New York from coma of kidney disease when he was thought to be suffering

from excessive indulgence in alcohol emphasizes the great care which should be exercised in the examination of such cases. The presence of the odor of alcohol on the breath should not be taken as the final evidence that the coma is due to alcohol.—**SUMMARIES IN MEDICAL ARTICLES:** Recent protest has been made against the nuisance of medical articles with titles which give no clue to the contents of the article. Another matter of inconvenience in medical articles is the frequent lack of summaries of contents. The summary is as a rule best placed as a series of conclusions at the end of the article. Such a summary arrests the readers attention, gives him an immediate orientation of the subject presented and indicates that the writer has clearly in mind what he has undertaken to state.—**APPOINTMENT OF ASSISTANT SURGEONS IN THE ARMY:** Of the 33 candidates appearing at the examinations recently held for appointment of assistant surgeons in the army only 11 completed the examination and of these only seven were found qualified. There are now 31 vacancies in the junior grade of the medical department and the prospects for filling them are poorer than for many years past. The recent increase of the coast artillery by over 5,000 men and the occupation of Cuba have increased the demand for medical officers. This dearth of candidates seems to be entirely due to the insufficient inducements offered in the medical corps of the army and the repeated failure of Congress to pass a measure for the relief of this condition.—**THE PRESENT STATUS OF CANCER RESEARCH:** After a judicious review of the subject of experimental study of cancer, A. Dietrich sees no reason for paying attention to any of the claims as yet put forth for a specific cancer parasite. The most fruitful investigations in this subject consist in the transplantation experiments with tumors primary in the domestic animals. Such tumors can be implanted only into animals of the same species and not into other, even closely related species. The process seems to be a transplantation or a metastasis from one animal to another inasmuch as living cancer cells must be transplanted to secure growths, ground cells, expressed juice and heated cells not producing tumors. The view of Ribbert that the cancer cell itself is the parasite of cancer seems to be almost beyond challenge in the light of the results of animal experimentation.—**A CHRONIC TYPHOID FEVER PRODUCER:** Soper reports the case of a cook who, having had a mild attack of typhoid fever five years ago, has since been associated with 26 cases of typhoid, including one death. She

was finally taken in charge by the Department of Health of New York City, where special examinations showed that while the urine was free from bacilli, the stools showed great numbers practically every day for several weeks and the blood gave a positive agglutination reaction. Of 1,700 persons examined at three laboratory stations in Germany 3 percent were found to be chronic carriers. Increased knowledge in regard to bacillus carriers is desirable in order that preventive measures may be applied effectively.—**THE PRESIDENT-ELECT:** The fidelity of New England to the best interests of the profession and its manifold contributions to the science of medicine and surgery are fittingly recognized in the selection of Dr. Herbert Leslie Burrell as President-Elect of the American Medical Association. Graduating from the Medical Department of Harvard University in 1879 he had since taken an active part on the teaching staff of that institution and now holds a full professorship in clinical surgery. He is connected with several of the hospitals of Boston and an active member of a number of the local, State and national societies. As Surgeon-General of Massachusetts in 1893 he won much praise for his work of reorganization and the efficient conduct of the medical affairs of the militia. His work in surgery has been brilliant and original and in education he has been one of the pioneers in emphasizing the importance of actual practical work for the student in preparation for practice later. He has always urged the importance of a proper education of the people in medical lines.—**THE THIRD ATLANTIC CITY SESSION:** For the third time in seven years the American Medical Association met this year at Atlantic City, N. J. Chicago was selected as the meeting place for 1908. The work of the House of Delegates was aided and shortened materially by the fact that most of the committee reports had been printed and distributed before the meeting, and some of the reference committees had been appointed and notified before the House convened. The House of Delegates was made up of a thoroughly representative body of men representing the highest and best of the profession. The attendance was larger than that of any other session and practically all the members were present at every meeting. Complete unanimity and perfect harmony marked the entire session. The attendance at the Scientific Exhibit and the Commercial Exhibit held in Marine Hall averaged 5,000 a day. The weather was cool but otherwise pleasant.—**ANIMAL EXPERIMENTATION AND THERAPEU-**

**TICS:** Professor A. R. Cushny, of London, in a recent publication lays emphasis on the dependence of modern therapeutics on animal experimentation. He states that very few of the many advances that have been made in the last 50 years could possibly have been made but for animal experimentation. The discovery of new and valuable drugs, the determination of their proper dose and effect, the discarding of countless drugs of reputed efficacy all are based on work with animals. These facts can hardly fail to impress any legislator especially when it is made clear that without the animal experiments every attempt to treat the sick would be an experiment, a human vivisection which animal vivisection renders needless.—**YELLOW FEVER IN CUBA:** The reappearance of yellow fever in Cuba after the apparent extinction a few months ago without its introduction from outside or its occurrence in any of the seaports or larger towns is probably due to the fact that, whereas in 1901 the inhabitants of the country and small towns were practically all immune, there has been in the past seven years a sufficient accumulation of nonimmune material from Spanish immigration and Cuban births, to support smoldering foci of infection. Sanitary matters outside of Havana are in the hands of municipal Boards of Health who are under the local authorities and so appropriate funds are not available to carry out proper sanitary measures. The decision, therefore, of Governor Magoon that the State shall assume control of the sanitary service in all towns will greatly help conditions. A study of this outbreak may modify our ideas about some of the phases of yellow fever and its transmission.—**TREATMENT OF PULMONARY TUBERCULOSIS BY TUBERCULIN IMMUNIZATION:** Trudeau has recently pointed out that the best results in the immunization of animals to tuberculosis are obtained by the use of living bacilli, that the immunity develops slowly and seems to be most durable when produced with living cultures. In the treatment of established tuberculosis, the essential action of all various tuberculins is the stimulation of the defensive resources of the organism and the production of probably both antitoxic and antibacterial immunity. Trudeau treats with tuberculin only those patients who are free or nearly free from fever, and finds that the more chronic the disease the better appear the results. He uses very small doses with the idea of avoiding marked reactions. His results show that of the patients treated with tuberculin 18 percent to 25 percent more were alive than of those not treated with tuberculin during the

past 15 years.—**THE ASSOCIATION OF APPENDICITIS WITH DISEASES OF THE GALLBLADDER:** Dieulafoy has called attention to this association and states that in nearly one-half of the cases the disease of the appendix precedes the gallbladder involvement, next in frequency the two conditions appear together, and less often the gallbladder disease precedes the appendicitis. The association appears practically always in adult life and there seems to be no especial sex susceptibility. Gallstones are found in two-thirds of the cases, cholecystitis without stones in the remainder. The infection probably takes place through the blood stream. When the disease of the gallbladder precedes that of the appendix it seems likely that the latter becomes infected because of the mechanical and structural peculiarities which render it especially vulnerable. The association of the two diseases is an important one and an exploration of both regions in operation for one of the conditions will no doubt save a good many patients from a second and unnecessary operation.

#### **The Boston Medical and Surgical Journal.**

—**TYPHOID SPINE:** This affection is probably the resultant of a neurosis, a functional aberration, an inflammation, and the result of a chronic toxemia, though each one of these factors alone has been looked on as the particular cause. Gibney, who in 1889 first described the condition, believes it to be an inflammation of the spinal ligaments, the periosteum and the intervertebral disks. MacRae has found by the röntgen ray bony changes in two cases, one of which was due to the paratyphoid organism. Typhoid spine is probably not directly due to the specific organisms for such lesions nearly always suppurate and in no known case of typhoid spine has this occurred. The differential diagnosis is from perinephritic abscess or Pott's disease, in both of which there is suppuration, and from arthritis deformans or spondylitis deformans. The prognosis is very good and complete recovery is assured by rational though prolonged treatment.—**HOUSING PROBLEMS:** The International Congress for Improved Housing, having its headquarters at Brussels, has formed an American Section with Mr. Robert W. de Forest as president, Richard Watson Gilder, vice-president and Dr. Wm. H. Tolman as secretary. The eighth annual meeting will be held in London from the fifth to the eighth of August when the whole subject of Housing Problems will be discussed. The Tenement House Commission appointed seven years ago in New York City gave a stimulus to interest in housing problems in this country

which achieved vast renovations. The erection of "model tenements" in which laboring people are assured sanitary and clean housing condition will be furthered by this coming meeting of the International Congress.—**THE ABSINTHE QUESTION:** The French Government has of late stopped the manufacture of absinthe on account of its very deleterious effects on the people, and Switzerland will probably follow its example. Although the history of absinthe dates back but a century, the amount consumed has increased in enormous proportions. Gantier found that the most characteristic symptoms of absinthism were spontaneous or provoked painful phenomena and a weakening of the lower limbs which may even go as far as paralysis. The genital sense and activity rapidly diminish and absinthics seem to be particularly susceptible to chronic digestive disorders and to tuberculosis. Hanseemann emphasizes the homicidal tendency of the absinthe drinker as well as the hallucinations, brutal character, ferocious jealousy and distrust.—**INDICATIONS OF EPIDIDYMECTOMY IN TUBERCULOSIS:** Keyes in a recent article concludes very favorably for the operation of epididymectomy. This operation frees the patient of a painful lesion and also a dangerous focus of disease. The infection may be either by the ascending route as seen largely in adults where the bacilli, entering by the urethra are stopped at the tail of the epididymis, or by the descending route as seen in children where the bacilli are arrested at the apex of the testicle and in the head of the epididymis. In the ascending tuberculous epididymectomy is quite sufficient in many cases and this leaves the testicle and its interstitial gland undisturbed. Castration is more radical, often necessitating a useless sacrifice and removes the seminal gland.—**THE HOUSING PROBLEM IN WASHINGTON:** Dr. George M. Kober in a recent article discusses the history and development of the housing movement in the city of Washington, D. C. While what he says applies particularly to the city of Washington, it also has a wide bearing on practically all of our American cities and the pamphlet should appeal to all those interested in the broader questions of prophylactic medicine.—**THE ATTITUDE OF TEXAS TOWARD TUBERCULOSIS:** It is reported that within a short time persons suffering from advanced tuberculosis are to be debarred from entrance to the State of Texas and that persons afflicted within the State will be quarantined, thus placing tuberculosis in the same category as yellow fever and smallpox. Such a course would not only bring up questions of law in its enforce-

ment, would be an expense to the State, but would have a deleterious effect on the fight against the disease throughout the country.

**Medical Record.**—**THE MANAGEMENT OF THE AMERICAN MEDICAL ASSOCIATION:** Favorable comment is made of the criticism of the management of the Association as it appeared in the May issue of *American Medicine*, and of the reforms demanded in the interests of progress.—**THE PROGRESS OF THE ANTITUBERCULOSIS MOVEMENT IN NEW YORK:** In a recent article, J. A. Miller calls attention to the advances which have been made in the sanitary control of tuberculosis, which includes a complete register of all cases in the city, an inspection of the homes of those who do not come under the care of a private physician, the distribution of pamphlets and circulars, regular disinfection after death from the disease and after change of residence and special prohibition against spitting in public places. The work of the special committee of the Charity Organization Society by means of public lectures stereopticon exhibits, cards and circulars of information has been a potent factor in the education of the laity. The sanatorium idea has been largely developed and exerts a tremendous influence for good. Special clinics have been established by the larger public hospitals where the patient is taught how to live and to care for himself and this instruction is reiterated and reenforced in the homes by the visiting nurse. The results of all this work can be characterized only as remarkable and show the value of concerted effort.—**THE ANESTHETIST:** In recent years with the advent of newer anesthetics and the more complicated methods of administering the old, the specialist in anesthesia has come to the fore. In a recent edition of his book on Anesthesia, Hewitt refers to the necessity of legislature enactments to control the administration of anesthetics. The legal responsibility in case of accident now lies with the operator. In surgery as it is carried out today the role played by the anesthetist may be of even greater importance than that played by the operator and the responsibility should, therefore, be shifted. For this the anesthetist must be properly qualified and instructed by special lectures, physiological experiments and practical applications of the various methods.—**RECENT ADVANCES IN OUR KNOWLEDGE OF SYPHILIS:** Since the discovery of the *Spirochæta pallida* by Schaudinn and Hoffman as the cause of syphilis our knowledge of the disease has been considerably increased. The organism has now been found in considerable numbers in the first and secondary stages of practically all cases of

syphilis, and recently in small numbers in tertiary syphilis by Doutrelepon, of Bonn. In inherited syphilis, it has been found both in the child after birth and in the fetus in almost every organ, though chiefly in the liver, stomach and intestines. According to Ehrmann the germs spread from the focus of infection along and even through the nerves, an observation of considerable importance in our knowledge of nervous diseases due to antecedent syphilis. Neisser and others have succeeded in inoculating monkeys with tertiary syphilis. From all these studies the conclusion is reached that syphilis is contagious in every stage and type and that every organ of a syphilitic person may harbor the germs of the disease. It has been practically proved that one attack does not produce an immunity to a subsequent infection. As regards treatment, mercury still remains the sovereign remedy. Recent experiments, however, seem to show that an effective serum may yet be discovered.—**THE TREATMENT OF CAISSON DISEASE:** The disease is met with in those working in compressed air and is believed to be due to the presence of gas emboli in the circulation. The workman should undergo a very thorough examination, be made accustomed to the increased pressure very gradually and observe special precautions after once accepted. The change from the caisson to the outer air should be gradual and proper living in the intervals of work be insisted on. Four types of the disease can be distinguished, which are termed bends, staggers, paralytic and comatose states. In the treatment of this disease, the first step is recompression of the patient, that is he is again subjected to the influence of compressed air. This in the severer cases may be supplemented by the application of various counterirritants, analgesics and other symptomatic treatment. The paralysis requires the routine measures applicable to the chronic state of peripheral neuritis.—**THE CAUSE OF SUBCUTANEOUS HEMORRHAGES:** Heyrosky, by injecting sterile filtrates of bacterial cultures into white mice, has been able to produce hemorrhages under the skin and mucous membranes which he believed to be due to a specific toxic action. This observation will be of considerable interest as it will doubtless place the treatment of hemorrhagic lesions seen in connection with various diseases on a more satisfactory and rational basis.—**PASTEURIZED MILK:** The New York City Board of Aldermen has decided that the pasteurization of substandard milk is neither necessary nor desirable. The agitation of the subject has at least emphasized the importance of

careful inspection of the farms and creameries at the source of the milk supply. While pasteurization may destroy some of the enzymes of milk, the destruction of pathogenic germs brought about by the same process far outweighs this slight objection. The experience of some of the other large cities and the report of the milk commission of Washington seem to favor the view that absolute cleanliness and proper sanitary measures in the milk business cannot be brought about at once and that for the present pasteurization is the best means at hand for procuring wholesome milk. Inspection is necessary but many years will be required before perfection can be secured in this way.—**THE CANCER PROBLEM:** Relative to this problem, Mr. Bland-Sutton is of the opinion that investigators would do well not to rely on histological methods alone for distinguishing between the various groups of malignant tumors but to supplement these methods by careful observation of the patient.

**New York Medical Journal.**—**EUTHANASIA:** The classical Greek word *ευθανασία* means simply an easy, peaceful or painless death. A few writers have given it a different meaning, that of deliberately killing a person painlessly as an act of mercy. *The New York Medical Journal* is misquoted as having admitted that euthanasia was commonly resorted to by physicians. It did say that physicians generally endeavored to secure euthanasia for the dying, which is a far different thing from killing a person painlessly.—**AORTIC ANEURYSM DUE TO RHEUMATISM:** Renon and one of his pupils, Feytand, have recently called attention to the fact that repeated attacks of rheumatism in young subjects 10-16 years of age is occasionally followed by the development of aortic aneurysm. Symptoms of aortic insufficiency and cardiac hypertrophy precede those directly of the aneurysm. Among the early phenomena are attacks of pseudoasthma with intense dyspnea but without pain, though the attacks may be painful like those of angina pectoris. These aneurysms develop toward the costal wall and give rise to the classical symptoms of aneurysm, with this difference, that they coincide with those presented by insufficiency of the sigmoid valves. When once formed the aneurysm develops in successive stages corresponding to the attacks of rheumatism. Cardiac hypertrophy favors the evolution of the aneurysm so that one can hardly count on regression and cure by obliteration of the sac because new attacks of rheumatism will destroy any favorable progress. The ordinary

end is death from hemorrhage, in an attack of angina, or from cachexia. The treatment is symptomatic.—**STUDIES IN EXPERIMENTAL ALCOHOLISM:** Reid Hunt has studied the influence of small quantities of alcohol on the animal physiology on the theory that alcohol toleration is due to an increase in the oxidation processes of the body. By observing the toxicity of acetonitrile or methyl cyanid on mice, guineapigs and rabbits under the influence of alcohol he seems to have proved that alcohol does increase the power of oxidation of the body. He also showed that the administration of alcohol is accompanied by an absolute and relative increase of the excretion of the ethereal sulfates in the urine pointing to an increase in intestinal putrefaction. It is, therefore, possible that this latter condition may account for some of the pathological effects of alcohol, as cirrhosis of the liver and alcohol amblyopia.—**PRESIDENT BRYANT'S ADDRESS:** This address, delivered at Atlantic City, had for its subject, "The American Medical Association, Its Aims and Interests." In the founding of the Association the one significant object in view was the promotion of the science and art of medicine. The measures announced at the time as necessary to this end were certainly of the worthiest and were calculated to promote the welfare of the entire medical profession and that of the whole world. In recent times there seems to be a desire to put the entire profession under the control of the superfine consciences belonging exclusively to a few choice spirits. Dr. Bryant did not speak openly of these matters but gave some hints that he had in mind the perils likely to come about from any radical deviation from the course of action originally proclaimed by the Association.—**THE LABORATORY MAN AND THE PRACTITIONER:** The cardinal point of Dr. Herrick's recent address before the American Medical Association on "The Relation of the Clinical Laboratory to the Practitioner of Medicine" was the need of cooperation between the laboratory man and the practitioner. The one should not maintain the finality of his findings without regard to clinical observation, and the other should show his own judgment in applying the laboratory findings to the case in hand. The laboratory man should be viewed as a consultant and the final opinion in a case should be his and that of the attending physician jointly.—**THE AMERICAN MEDICAL ASSOCIATION'S SURPLUS FUNDS:** The Treasurer's report shows that the assets of the Association amount to about a quarter of a million dollars and the question arises as to what should be done with

this money. The accumulation of a vast fund for contingent liabilities seems hardly necessary. The appropriation of \$50,000 a year for the purpose of enabling men to enter upon systematic research in medicine would certainly make for the advancement of medicinal science and promote considerably the interests and aims of the Association.—**AN AMERICAN SCHOOL OF TROPICAL MEDICINE:** Dr. Isaac W. Brewer in a recent article makes a plea for the establishment of an American School of Tropical Medicine and prefers that it be situated at New Orleans. There seems to be no question as to the necessity for such a school but there is a question as to whether, if it were established, there would be enough students to apply for admission to make it worth while to organize a separate staff. As to the suitability of New Orleans as a location for such a school it may be pointed out that in reality New Orleans is a subtropical city and so not a suitable place for study throughout the year. New York or Philadelphia, would be more appropriate, a greater portion of the year is suitable for study, library and general medical facilities are more extensive in both places and the amount of clinical material which could be obtained would be considerable. With this latter point in view New York would be preferred.—**NEW YORK'S MILK SUPPLY:** The keynote of the report of the specially appointed Milk Commission in New York is the recommendation of increased inspection at the sources of supply. The danger of contracting tuberculous disease from milk is considered as overstated and negligible in view of special legislation now in progress. The use of score cards for rating the dairies and of labels showing the name of the farm and creamery from which the milk comes as recommended by the commission is impracticable. The suggestion is made that skimmed milk may be sold provided it be so labeled. Milk stations for the distribution of pasteurized and modified milk to the poor are advised. Pasteurization is not recommended as the "cure all" but should be carried out according to circumstances and the milk should be properly labeled. Milk with 50,000 bacteria to the cubic centimeter should be destroyed.—**PARAGONIMIASIS:** Musgrave in reporting 17 cases of this disease divided them clinically into the generalized, the thoracic, the abdominal and the cerebral. The lesions may be nonsuppurating, tubercle-like, suppurating or ulcerative and are characterized by their dull bluish slate color without evidences of pigmentation, their resemblance to necrotic abscesses and the character of their contents which

resemble anchovy sauce and contain adult parasites and their ova. As a rule there is no evidence of inflammatory reaction about the lesions. Infection probably takes place through the gastrointestinal tract and spreads by the lymphatics. The diagnosis is made by the finding of ova in the sputum, in the feces, in the scrapings from ulcers or in fluids and tissues removed at operations. The disease is usually chronic and the prognosis bad, death usually being due to some intercurrent disease. Potassium iodid gave good results in one case. The use of uncooked food or unboiled water is probably the best prophylactic measure.—**THE TREATMENT OF HEADACHE:** Dr. Beverly Robinson in a recent article gives some useful hints as to the treatment of certain forms of headache. The etiology must always be considered and the cause eliminated if possible. Such causes include anemia, gout, rheumatism, febrile conditions, syphilis, and morbid conditions in the nose, the pharynx, the uterus, the ear or digestive organs which act in a reflex way. Neurasthenia is a cause of a great number of headaches and one hard to treat. While much can be done in this way to diminish the number and severity of the attacks, a permanent and absolute cure is quite another thing. In most cases of sick-headache the final and only appeal left us is unfortunately the hypodermic of morphin.—**THE DUTY OF SOCIETY TOWARD THE CHILD AT SCHOOL:** Dr. S. A. Knopf, of New York, considers the subject of physical, mental, and moral hygiene of our schools equal in importance to that of any of our social problems. The child is not only exposed to the danger of communicable diseases but to the diseases incident to overwork, mental strain, eye-strain and ear strain. Among the remedies proposed are the necessity of giving the child more years of play, the training of teachers in the diagnosis of disease, the limiting the number in the classes to enable the teacher to come in closer contact with the pupil, the establishing of classes for the mentally defective and backward, and the avoiding of pushing the mental development to the detriment of the physical welfare of the child. The children of the well-to-do should be taught to help those less fortunate. By instituting these reforms the mortality of our school children would be decreased, our reformatories and prisons would be less crowded and future generations be made up of finer men and women.—**VENOUS THROMBOSIS OF THE ARMS IN ASYSTOLIA:** Venous thrombosis as a complication of mitral asystolia appearing usually in the right arm. The clot usually contains

bacteria. Edema, local cyanosis, dilation of superficial veins with the absence of pain in the part characterize the condition. The asystolic symptoms become more accentuated when the thrombosis develops and the pulse will be found filiform and arrhythmic. The condition, while not in itself fatal, at least indicates an infection and its appearance accelerates the progress of the disease and renders the prognosis serious.—**THE "PRENUPTIAL SANITARY GUARANTEE:"** Dr. Edward L. Keyes in a recent paper demonstrates the utter impracticability of all proposed schemes for insuring either party to a matrimonial contract against the danger of contracting venereal disease from the other party. Voluntary submission to an examination before marriage is perfectly honorable but coercion is not to be thought of. The honor and honesty of men and women must continue to be relied upon and it will be an evil day for humanity when to any great extent they prove untrustworthy.—**THERAPEUTIC LUMBAR PUNCTURE IN TUBERCULOUS MENINGITIS:** Only a few cases of recovery from tuberculous meningitis are on record. Hougardy recently reported such a case where lumbar puncture was used not only for confirming the diagnosis but as the chief method of treatment. The value of lumbar puncture is thus emphasized and its use in tuberculous meningitis may lead to a revision of the present unfavorable prognosis by systematic writers and clinicians.

**The Lancet.**—**THE CONTROL OF SUPER-NORMAL ARTERIAL PRESSURE:** Dr. George Oliver in a recent paper points out that a rise of blood-pressure may be temporary and produced usually through nervous influence, or permanent and due to some alteration in the chemical compositions of the blood or to some organic changes in the circulatory apparatus. Treatment for correction of this phenomenon must be largely symptomatic. He recommends a reduction of the ordinary diet as a whole with a diminution of the animal and an increase in the vegetable food material. Proper cooking, the omission of extractives and limitation of liquids at meals are also emphasized. Rest is the best sedative to increased ventricular action while moderate exercise is of value in many cases. Balneological treatment is beneficial. Proper cutaneous circulation should be maintained. Medicinal treatment should be directed to secure free evacuation, to obtain gastrointestinal antiseptics, and to produce vascular dilation and control of the vasomotor apparatus. While Dr. Oliver suggests nothing original in the treatment of this condi-

tion he sets forth the results of a careful examination of old remedies in the light of recent research and emphasizes the value of the hennomanometer for purposes of diagnosis and of gauging the results of treatment.

**The Montreal Medical Journal.**—THE MORAL TREATMENT OF DISEASE: A combination of church and the science of medicine has taken place in Boston and a dispensary established for the treatment of cases of disease other than organic, to which each patient must bring from his or her physician a certificate stating the willingness of the physician that treatment should be given. The staff is made up of neurologists and clergymen. Religious belief on the part of the patients will not form the subject of inquiry and no payment will be accepted in return for services rendered. With a staff of scientific men the treatment should be carried out upon the basis of experience rather than upon that of fanaticism and a proper estimate placed upon the modes of treatment usually employed by faith healers of all kinds.

**Central States Medical Monitor.**—FALSE IDEAS ABOUT DENTITION: People should be taught that dentition in children does not cause disease nor is it the primary cause of sickness. Teething may, however, be associated with any kind of disease. Guthrie has recently discussed some of the explanations given for these coincident disorders. He divides them as follows: (1) The reflex theory. (2) the pyrexial theory, and (3) idiosyncrasy and general nervous instability. Each of these theories has its bearing but none give proper explanation for diseased conditions of the body apart from teeth themselves. Rather these coincident disorders often precede the eruption of a tooth and convert a simple physiological process into a difficult, painful and unnatural one. Simple scarification of the gum will often give relief but more often a correction of the gastric intestinal disorder will bring about the same result.

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## NEWS AND NOTES.

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### Opium in the French Navy and in China.

—The use of opium in the French navy is said to have become exceedingly prevalent among both officers and men. The Minister of Marine has been obliged to issue an order that the names of officers suspected of using the drug be reported to him, and has forbidden the presence on the vessels of any articles used in opium smoking. A new edict has been issued in China which orders all officials to use every effort to

carry out the provisions of the antiopium edict previously issued, and commands an investigation into the quantity of land at present devoted to the cultivation of opium. In addition to threats of punishment for officials dilatory in executing the regulations, rewards are promised for those who are active in the work.

**A Consolidation of Medical Schools is Reported from Louisville, Ky.**—Overtures for the consolidation of the Kentucky School of Medicine with another school of medicine in that city are said to have been made. If the plans materialize Louisville will begin sessions in the fall with two schools of medicine instead of five.

**Vacancies in the Army.**—There are still 22 vacancies in the junior grade of the medical department of the army. There are 17 applications on file from physicians who wish to take the next examinations, which begin on July 29. None of these applications are from the hospitals located in the cities.

**Free Pasteurized Milk.**—The Health Board of Jersey City has decided to establish a depot in the basement of the City Hall for the free distribution of pasteurized milk. Poor women presenting prescriptions from a physician for pasteurized milk for infant feeding will receive it without charge. It may also be obtained without a prescription by paying the cost of the bottles. The free dispensaries maintained at drug stores for several summers will be abandoned and the dispensaries' appropriation will be used to support the free milk depot. Substations will be opened in the basements of public school buildings.

**Absinthe not to be Forbidden.**—The Commission on Hygiene of the French Chamber of Deputies has rejected the bill recently introduced which provided for the total prohibition of the sale of absinthe on the ground that its consumption was a menace to the prosperity of the country. The commission refused to sanction the measure, alleging that it could not discriminate between absinthe and many other liquors but it recommended the passage of a law forbidding the sale of the cheap imitations sometimes sold under the name of absinthe.

**Consolidation of Medical Journals.**—The *Interstate Medical Journal* (St. Louis) announces the purchase of the *St. Louis Courier of Medicine*, one of the oldest medical journals in the west, and its consolidation with the *Interstate* on July 1, 1907.

**Pollution of State Waters.**—The special committee of the Merchants' Association on pollution of State waters of New York announces

that Governor Hughes has begun a thorough investigation into the pollution of State rivers and streams by pulp and sulphid mills. He has ordered the State Commissioner of Health to make inquiry into complaints in regard to mills at Fort Edward, Glens Falls and other points in that vicinity.

**The Accommodating Liquor Prescriber.**—The United States Commissioners of Internal Revenue has made a ruling that physicians who prescribe for their patients intoxicating liquors not compounded into medicines and who fill the prescriptions themselves are liquor dealers and must pay the regular federal liquor dealers' tax of \$25 a year.

**Decrease in Trachoma.**—The Territorial Board of Immigration of Hawaii reports success in the treatment of trachoma among Spanish immigrants. Over 30 patients were allowed to leave the quarantine station in one week and only a very small percentage of the immigrants afflicted with the disease will be deported.

**Russell Sage Institute of Pathology.**—Mrs. Russell Sage has given \$300,000 to found the Russell Sage Institute of Pathology to perform the duties of pathologist for the City Hospital and the City Home for the department of charities on Blackwell's Island. She specially requests that this institution make a specialty of research into the problems of all diseases, and more especially to those incident to old age. She delivered to the Russell Sage Foundation securities to the market value of \$300,000 the income of which is to be applied to the institution. The institution will be incorporated. The salaries of the scientific workers, the expense of special research work, and the maintenance of a proper working library and the publication of results will be borne by the income of the endowment, while the buildings, their care and the cost of the routine work directly for the patients will be borne by the city. This is the first time in New York that there has been a cooperation of private beneficence and city support in the development of scientific work in any institution, but there is a precedent in Frankfort, Germany.

**Medico-Chirurgical College (Philadelphia).**—The school has planned to offer a preliminary year devoted to physics, chemistry, biology and modern languages, beginning this fall. While the course is optional, a special inducement is offered by the arrangement that for those entering during the session of 1907-8 the total fees for the five-year course will be the same as for those entering on the four-year course.

**A Case of Plague in San Francisco.**—On the evening of May 23, 1907, a sailor from the steam tug *Wizard*, engaged in towing lumber schooners from San Francisco to Coos Bay, Oregon, was admitted to the Marine Hospital, San Francisco, suffering from what was at first thought to be a simple bubo. The patient died suddenly on the morning of May 26. The autopsy and bacteriological findings, which were confirmed by Surgeons Austin, Long, and Currie, proved the case to be one of bubonic plague.

**A Quarantine Inquiry.**—Governor Hughes is planning an investigation of the offices of the New York State Quarantine Commissioners. The terms of all three have expired, but it is believed that the Governor will permit them to hold over until the investigation be completed. The term is three years, and the salary \$2,500.

**Glasses for School Children.**—The New York Board of Education has decided to request the Department of Health to make an expert examination of the eyes of all the children in the public schools of the city to determine the exact number for whom glasses ought to be provided. The committee to whom the resolution was referred said the estimate of 36,000 children needing glasses was too low. The report also stated that the examinations made were inadequate to determine the extent of myopia or to provide accurate data for the treatment of those afflicted.

**Army Examinations Made Easier.**—An essential feature of an amendment recently made of the regulations for the examination of assistant surgeons of the army is that which eliminates certain mathematics, geography, history (especially of the United States), general literature, grammar, and the reading of easy Latin prose from such examinations in the case of applicants holding diplomas from reputable literary or scientific colleges, normal or high schools, or of graduates of medical schools requiring an entrance examination satisfactory to the army medical school. Experience has shown that applicants for these positions who have been away from their alma maters for some years, and in the meantime have been in the active practice of their profession are frequently rusty on some of the branches referred to, and do not feel that they can readily pass the examinations.

**Health in the Canal Zone.**—According to the latest report of Colonel Gorgas to the Canal Commission, the health conditions in the zone are better than ever before. The largest per-

centage of malaria for any week in the month of May was .65 of 1 percent, and it has been as low as .52 of 1 percent. The percentage of all disease has ranged from a minimum of .96 of 1 percent to 1.1 percent. The prolonged dry season and the late beginning of the general summer rains have been productive of conditions unusually favorable to the rapid breeding of mosquitos, so that it has been necessary to carry out the work of mosquito extermination with greater activity than ever before.

**The National Association for the Study and Prevention of Tuberculosis** has elected the following officers: President, Dr. Frank Billings of Chicago; vice-presidents, Dr. Mazyck P. Ravenel of Philadelphia, and Dr. John P. C. Foster of New Haven; secretary, Dr. Henry Barton Davis; treasurer, General George M. Sternberg.

**Personal.**—The Portuguese members of the Fifteenth International Medical Congress, held in April last, have presented PROFESSOR MIGUEL BOMBARDA with a gold medal and an address expressing their appreciation of his services as organizing secretary of the congress.—The Emperor of Austria has conferred on DUKE KARL THEODOR, of Bavaria, the Order for Art and Science in recognition of his distinction as an ophthalmologist.—DR. JOHN S. FULTON has resigned as secretary of the Maryland State Board of Health after serving ten years. He will become secretary-general of the International Congress of Tuberculosis, the greatest organization of its kind in the world. He will continue to reside in Baltimore.—The degree of Doctor of Laws was recently conferred on DR. JOSEPH D. BRYANT, professor in the Bellevue Hospital Medical College, New York. Dr. Bryant has been professor, first of anatomy and then of surgery, in the college for 39 years.

**Trained Nurses for the Navy.**—Surgeon-General Rixey is preparing to make a strong appeal to Congress at its next session to supply a deficiency in the medical branch of the naval service, the absence of trained nurses. The American blue-jacket has to rely in sickness upon a hospital steward and an apprentice. In ordinary times the ship's surgeons are often taxed to care properly for the normal number of sick and injured. When there is an epidemic of fever or measles (the latter often a serious malady among male adults), such as occurred not long ago on the big battleship Connecticut, it has been found impossible to give the invalids the necessary scientific nursing required. The Surgeon-General has therefore worked out the

details of a plan for the organization of a corps of trained nurses, such as the army has. Afloat, these nurses will be necessarily men, but in the navy hospitals ashore, where the more difficult lingering and dangerous cases are treated, they will be women. For \$45,000 Surgeon-General Rixey feels that he can make a respectable beginning in the organization of such a corps, and he is seeking support from the Secretary of the Navy and the President, to get the necessary appropriations by Congress.

**"No Fee, No Doctor."**—At a recent meeting of the Mercer County, New Jersey, Medical Society a resolution was passed to the effect, "no fee, no doctor," the secretary to keep the list of the people who are slow of pay. Every doctor is pledged to send these names in. A working arrangement was arrived at with the homeopaths, who have maintained such a system for years. When many of the doctors gave the names of slow-pay patients it was found that one family had run the entire round of the physicians in Trenton. Others had done nearly as well.

**Special Tuberculosis Diet Stopped.**—The supplying of milk and eggs as a special diet for the tuberculous by the New York Board of Health has been discontinued for lack of funds. During 1906 the health department furnished over 22,000 quarts of milk and 44,500 eggs in Manhattan alone. Altogether there were 50,000 quarts of milk and 96,000 eggs given away.

**Prepared Serums Supplied by German Central Authorities.**—Eight prepared serums are now supplied by the German Board of Health for diagnostic and medicolegal purposes: Agglutinating and bactericidal, cholera and typhoid serums, agglutinating paratyphoid serum and dysentery serum, and a precipitating serum for the biologic blood test. These serums are kept constantly on hand ready for official tests at any time.

**Indiscriminate Prescribing of Alcohol.**—The Jefferson County, Alabama, Medical Society has placed itself on record as being opposed to the indiscriminate prescribing of liquor by physicians, and suggests, to limit such illicit prescriptions, that every prescription be recorded in a book open to inspection by the county health officer, the record to show the prescriber, date, amount, kind of liquor, etc.

**Dust in Politics.**—The Imperial Board of Health in Germany is discussing the dust question as likely to influence politics. The automobiles whirl up such clouds of dust that the parks and boulevards have ceased to be breathing places where the poor and middle

classes can go for fresh air. The Germans have enjoyed for many generations their custom of family outings to the outlying parks, but now return to their homes in the city at night choked with dust and unrefreshed by their outing. The *Deutsche med. Wochschr.* is of opinion that it is now incumbent on the cities to provide pure air for their citizens to breathe just as they have made arrangements to provide good drinking water.

**Sleeping-sickness in the French Congo.**—The acting Commissioner-General of the French Congo, has recently issued a circular in which it is pointed out that, in view of the encroachments of the disease, an accurate knowledge as to its geographical distribution in the French Congo is urgently needed. Information is asked for as to the place origin of sleeping-sickness, and as to the mode of its diffusion; whether at the present moment it is making progress or receding; whether it occurs in epidemics with intervening periods of remission; whether in villages there are points that are more particularly contaminated; and, if so, what is the situation of these points in relation to neighboring rivers.

**A Modern Chinese University.**—It is announced that a great university on modern lines is to be established at Peking. It is to be organized on European models, and will have eight faculties—theology, law, history and literature, medicine, natural science, industry, agriculture, and commercial science. In the higher colleges connected with the university system English is to be compulsory, while to those who study in the departments of chemistry, electrotechnic, metallurgy, or forestry the study of German is recommended.

**Suicide by Fire.**—In Cuba during the last five years 50 persons have committed suicide by setting fire to their clothing. Only three similar cases appear on record elsewhere. In Cuba the victims were 44 women and 6 men—4 percent of the total number of suicides during that period. This large number is ascribed to the sensational illustrated accounts in the lay press of the first case, which seemed to inspire an actual epidemic of this mode of suicide. More than half the victims were of negro blood.

**Scarcity of Naval Surgeons.**—The medical corps of the navy has not been able to get enough surgeons to meet the needs of the service. Surgeon-General Rixey has undertaken to give temporary appointments as "acting assistant surgeons" to the young men who will pass a satisfactory preliminary examination and come to Washington for instruction. They will

receive six months' special training at the Naval Medical School and Hospital, or at the Mare Island Naval Hospital. At the end of that course they will receive appointments as assistant surgeons, with an annual salary of \$1,760, supplemented by allowances of \$432 and mileage. The shortage of doctors in the navy has become really serious. There are 64 vacancies in a corps that at its maximum should number only 350.

**Pellagra in Roumania.**—The staple crop of Roumania, or at least the staple food of her peasantry, is maize, and last year's harvest is stated to have been the best yet recorded, reaching a total of 126,000,000 bushels. Whether the grain was harvested in good condition does not appear, but it seems that pellagra, always more or less prevalent in this country, has lately considerably increased. In 1901 the number of cases was recorded as being 33,645, but in 1905 this had risen to 54,689, and now it is reported in the papers, though not officially, that last year the cases exceeded 100,000 in number. No statistics on this head are given in the report, and the fact that in the tables of mortality for Bucharest only three deaths are ascribed to this disease proves nothing, as the malady is one especially affecting the poorer country districts. Indirectly it may account for the very high infant mortality, for nearly 22 percent of the children born, die before they are a year old, and in some districts in Northern Moldavia half the deaths registered are those of children under five; indeed, it is estimated that 60,000 children under this age die every year in the rural communes.

**Prolongation of Life in Iceland.**—The British consul at Reykjavik, in his annual report, mentions that the population of Iceland in 1905 was 80,500, and adds: "A very interesting fact is the prolongation of human life. The medium age in the country in the period 1830-49 was 33 years; in 1851-60 it was 35.4 years; in 1891-1900 it was 55.9; and in 1901 it was 61.8. The chief reasons for this prolongation of life are the increase in the number of physicians and the strong measures against the introduction of infectious diseases into the country."

**Advocates of a pure milk supply** for New York City were routed in the Board of Aldermen recently. Final action was taken on the ordinance for compulsory pasteurization by dealers, under the eye of the Board of Health, of all milk below a certain standard of purity. The ordinance was defeated by a vote of 29 to 20.

**An association, for the advancement of**

**science** on the lines of those of America, England and France, has recently been founded in Italy. It will hold its first meeting at Parma in September. The association is in reality a revival of the Society of Italian Men of Science which held its first meeting at Pisa in 1839 and its last in 1870. The old society, however, had come to be used more as a means of political propaganda than for the furtherance of science; hence the discontinuance of its meetings when the unification of Italy was achieved.

**For the Emergency of War.**—The Surgeon-General of the army has had prepared in book form plans and specifications for 500-bed base, and 324-bed stationary hospitals, to be erected in the event of war or other emergency. The information is compiled in this convenient form in aiding constructing quartermasters in establishing hospitals. The buildings are of simple construction and can be carried out by ordinary builders with material which can be purchased in any market. In the interests of simplicity a single type of building has been adopted for all purposes, as the various structures differ only in their interior arrangements. The possibility of the necessity for largely increasing the capacity of the hospitals has also been kept in view in making the plans for the administration, storage, kitchen, and other buildings. A number of block plans are also included which would serve merely as suggestions for arranging the buildings, as the character of the terrain would necessarily determine the proper grouping.

**Country employment for the tuberculous** is the subject of a report made by a special committee of the Committee on the Prevention of Tuberculosis of the New York Charity Organization Society. The committee, bearing in mind that for many years the dispensary physician and the private doctor have been ordering tuberculous patients to leave the city and to get light work in the country, decided to make a systematic investigation of this method of dealing with tuberculosis. It took only a few days to discover that, badly as farm help was needed, the farmers were not taking kindly to the sort of labor commodity offered to them, even at low wages. If the men were well, but ignorant of farming, they could be taught; if they were acquainted with farming, but sick, they could have the light end of the work while strength was returning, but with men weak and untrained and driven to the soil only by disease, there was, naturally, no demand whatever. As an experiment, ten tuberculous patients were sent to farms. Only two cases were entirely

successful, two were partially so and the remaining six were failures. The committee, therefore, strongly advises physicians and others not to send tuberculous patients to the country to shift for themselves, for the reason that any scheme for the country employment of the tuberculous should offer facilities for the careful adjustment of work to the physical ability of each patient. This should be under medical supervision.

**The "Fourth Disease."**—The recent appearance in various parts of this country of the so-called "fourth disease" (Filatow-Dukes' disease) is directing renewed attention to the entity of this symptom-complex. In a late issue of the Public Health Reports, Passed Assistant Surgeon J. W. Schereschewsky enters into a thorough discussion of the disease. He says that the disease is much like scarlet fever, but differs from the latter in the length of its period of incubation, the mildness of its invasion, the benignity of its course, the absence of complications, the character and length of the period of "peeling," the brief duration of its infectivity, and in that it does not confer immunity to other similar diseases. He holds that "it would seem to be established beyond reasonable doubt, that the fourth disease complies with those conditions which entitle it to a place as a new entity in the catalog of the eruptive fevers, namely, that it has been seen to attack individuals who have had rubella (rose rash) and scarlet fever, and that, conversely, it does not protect against either of these diseases. Moreover, a certain amount of internal evidence can be adduced in support of the independent existence of this disease." However, he believes that it would be advisable, for the present at least, to leave the question of the "fourth disease" *sub judice* until sufficient data has been collated to settle the matter once and for all, and in the meantime to treat all mild scarlatiniform exanthems as scarlet fever. Cases of the disease have been reported by physicians from every section of the country, and it is observed in adults as well as in children.

**Austrian Medical Students.**—The total number of students registered in the medical faculties of Austria in the last winter semester was 3,715. These were distributed among the several universities as follows: Vienna, 1,725; Graz, 360; Innsbruck, 162; Prague (German), 273; Prague (Bohemian), 475; Lemberg, 219; Cracow, 501. Of the whole number, 134 were women, of whom Vienna had 52, Graz 1, the German and the Czech Universities of Prague each 8, Lemberg 26, and Cracow 39.

# American Medicine

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**The elimination of therapeutics from State examinations**, a suggestion to which we referred in our last issue, was also proposed by Dr. H. B. Young, of Burlington, Iowa, in *American Medicine* of May 25, 1901, and his communication should have been mentioned. As the matter will be brought before one or more Legislatures in their coming sessions, the article is republished in this issue. We are informed that Dr. Young's remedy for deplorable conditions as to multiple boards has been highly endorsed by both physicians and lawyers, and there does not seem to be any reason why it should not be enacted into law in the near future. It is regrettable that his valuable suggestion was not taken up long ago.

**The title "doctor"** should be conferred by universities as a certificate of "learning" of any kind. Its appropriation by the medical profession is unwise, as it does not indicate skill. The examining board does not grade skill either, but merely determines whether the candidate is sufficiently learned to be "licensed" to practise. It is not illogical to omit "Practice," for the real purpose is to eliminate dogma, and, as explained before, he who spends years in acquiring learning in the other branches can be presumed to know how to practise. He cannot help knowing enough therapeutics for he will imbibe it with the rest. Let there be one board, one examination, everyone treated the same, and no "class legislation."

**The trend of medical practice** is described by Dr. Franklin C. Clark,<sup>1</sup> of Providence, R. I., in an article which deserves serious thought. It is really an account of the evolution of the relation of the physician and pharmacist—the prescriber and dispenser of drugs. He shows that the two callings have always overlapped, so that at times, in certain countries, they coalesce. No man is big enough mentally, to be highly expert in both, so that the two are separated for all time to come. Indeed, good ethics really demands the separation, for the one who orders a drug should not be the one to profit by its sale, or he unconsciously sells the most profitable and least effective. Yet no pharmacist can always avoid giving free advice nor can country doctors avoid giving free medicine. These conditions must be recognized and legalized, for they cannot be prevented.

**The need of a third profession** is the startling thought suggested by Clark's learned article. He shows that the average poor man cannot afford to pay two bills—one for advice and one for drugs. If the illness is slight the sufferer buys the drug which the pharmacist advises, and only when very sick does he pay the doctor to advise him what to buy. The vast majority of medical practice therefore is lost. Public health suffers from unwise drugging and millions of dollars are frittered away on useless

<sup>1</sup> Medical Library and Historical Journal, June, 1906.

patent medicines. England, for centuries, has solved the problem by the employment of a class of men not highly expert yet learned enough in both professions to be safe in ordinary diseases, and who openly and legally sell both advice and drug, for a fee less than the cost of the average bottle of patent medicine. The poor sick man is properly treated and retains his self-respect, but in America he is either swindled by quack drugs or is pauperized at the free dispensary.

**Should Counter Prescribing be Legalized?**—Not necessarily, or at least not what is now meant by such practice. But, if the drug-seller were taught some medicine, he would be as safe as he has proved to be in England, where the three professions are really in harmonious existence. The commercial doctor, who is afraid of losing some paying patients, need not worry; as the new class of cases prescribed for will be those who now get no advice at all or who are charity paupers. Many splendid country practitioners are already in this middle profession. Why not have some city ones too? The patent medicine and charity evils are essentially of the city, though the former has spread to the country. It does seem that Clark has struck the solution of these evils, and of a third one soon to be acute enough to demand abatement.

**Some of Our Best Men Cannot Afford a Medical Education.**—The history of medicine shows that many of the leaders, like Jenner, were educated in the drug-store, and perhaps American drug-stores might do as well. The colleges, by their absurd insistence in trying to teach each student as much as three brains can absorb, are needlessly prolonging the medical education of practical men and making it prohibitive

to all except the rich. The graduates are not content to work for small fees. Many sink into shady work, and the poor are neglected. It might not be possible to make every sick person pay for services rendered in restoring his health, but we can come precious near to that ideal if we try. We must try, for we are pauperizing the poor and lowering the standard for public honor. A course of instruction for apprenticed drug clerks can be arranged, so as to teach them enough to treat minor ailments and do minor surgery, and yet be learned enough to know serious things when they see them and send the patient to a real doctor or "learned man."

**The doctor-druggist** is really an old acquaintance. Unless such a middle class is legalized, a large proportion of graduates will be compelled to adopt it for a living, and the money spent at college will be wasted—much of it is wasted on fools anyhow. Many druggists will continue to be mere agents of patent medicine swindlers, instead of honest, self-respecting minor practitioners. It is not possible to stop all prescribing by the real druggist, unlearned in medicine, and all vending by the real doctors, unlearned in pharmacy, but we can come very near to this ideal also. The danger of the doctor-druggist prescribing only profitable drugs will still exist, but it seems to be a negligible factor in England. The past scandals in medical education were due to the popular demand for cheaper medical advice by the mass of people who do not want "top-notchers." The degree of doctor "learned" should be restricted to the graduates of the college giving extensive courses in medical learning, and after severe examinations. The lesser courses, as in England, could well lead to a license to practise, without the title of "doctor."

Perhaps in time our most skilful practical men would resent being called "doctor" which merely means "learned" and does not imply practical skill or experience.

**"Slow fever" of the Southern States** was described by Dr. H. F. Harris,<sup>1</sup> of Atlanta, Ga., in the Section on Practice at the last meeting of the American Medical Association. This article will do much good in the way of rousing our Southern brethren to a realization of the fact that typhoid fever exists everywhere and in myriad forms and that public health compels us to consider every continued fever as typhoid until it is proved otherwise—a new fever must not be "discovered" until the old kinds are excluded. "Slow fever" is surely not malaria, for the organisms are not found and quinin is ineffective. Harris stated that in over half of his cases the typhoid bacillus was demonstrated, the paratyphoid in one-fifth, and both in 2.2 percent. It is safe to say that one or the other was really present in most if not all of the 26½ percent in which nothing was found.

**The typhoids of hot climates** are generally milder than those of cold, though no one seems to know why, unless it be due to the fact that the bacillus is injured by tropical heat. Nevertheless, physicians who practise in northern communities where typhoid is endemic, report that they have numerous cases which are the same as the "slow fever" of the South, so that the mildness of southern typhoids may be more apparent than real.

**Short fevers of unknown cause** are called "ephemeral," "febricula" or "simple continued" according as they last one, two or more days, but if they continue

over four days, it is good policy to label them typhoid and be done with it, for this course is safest for the patient and community. This system is best while we are investigating the causes of the short tropical and subtropical fevers. These are believed to be due to digestive disturbance, unknown hemic parasites or the sun's rays; but it is quite evident that the "slow fever" of Dr. Harris does not include these. In this respect it is quite unfortunate he should have perpetuated the name "slow fever," for both it and "mountain fever" should go the way of "typhomalaria." It is of national importance; for the widespread ignorance as to atypical typhoid and the prevalence of as many other names, were the causes for the failure to prevent the awful spread of typhoid in the camps of 1898. The first cases were mislabeled. At the present time, too, the failure to recognize the disease merely allows it to spread and will cause disastrous results if large numbers of people congregate in the infected districts. It is even wise to suspect that paratyphoid is a modified typhoid, and to do away with this name also.

**The nature of heat stroke** is discussed by Staff Surgeon Senftleben,<sup>1</sup> of the German army, who seems to think that excessive perspiration causes hemoglobinemia, which in turn destroys some leukocytes and liberates fibrin ferment, and that this in turn causes the fever as well as more or less extensive coagulation in the pulmonary capillaries. Vascular pressure then falls and death results from the general asthenia due to suspension of functions of nerve centers. The logical treatment, of course, beside rapid reduction of temperature, is the old plan of venesection and the infusion

<sup>1</sup> Berliner klinische Wochenschrift, June 24 and July 1, 1907.

<sup>1</sup> Journal, August 3, 1907.

of salt solution. The danger signal is the sudden cessation of perspiration and the main preventive measure is the ingestion of sufficient fluids. These are all wellknown facts and it is surprising to find soldiers taught to abstain from drinking water on a hot march.

**The complete etiology of heat stroke and heat exhaustion** is not understood by a great deal. It is rather surprising that all our discussions on the subject should refer solely to the heat rays and not to the equally dangerous light rays, while tropical experts are now giving as much attention to the one as to the other. Insects exposed to cold light rays and ultraviolet are killed in a few minutes if the rays are strong enough, and their temperature is not raised a particle. The radical differences between our two forms of "heat" stroke and "heat" exhaustion may be due to the light, after all, and there is some evidence that depressive symptoms are due to the light and the sthenic ones to the heat, though in the absence of definite information on the subject, no safe conclusions are possible at present. The excessive perspiration which Senftleben thinks is at the basis of the serious symptoms, might be induced by either heat or light; but the nervous symptoms and temperature may differ in the two forms according as there is stimulation by heat or paralysis by light.

**The complexions of "heat" sufferers** should give data of considerable etiologic importance, when studied in connection with the environment. Negroes have been known to get real "sunstroke" from working in hot fire rooms, and as the light never penetrates their skins it would be interesting to record the cases of "heat exhaustion" in this race, to prove that light has

nothing to do with either form. On the other hand, there is an impression that the very blond suffer more from "heat exhaustion" when they are exposed to much sunlight in addition to the heat, and it was this form which predominated in the dreadful epidemic of the Elks parade in Philadelphia—an epidemic which ceased with the oncoming of darkness. By all means, let the complexions of sufferers be recorded, and the possibility be kept in mind that "sunstroke" may be thermic, and "sun exhaustion" actinic, and that mixed forms may occur of every conceivable variety.

**The relation of stature and sunstroke** is apparently remote, but it has long been an article of faith among East India physicians, that the big blond men did not stand the tropics as well as the little men. The subject is brought up by the recent death by sunstroke, in the Philippines, of an army officer who was noted for his tallness and splendid physique. There must be something in mere bulk of frame which prevents proper radiation of heat and causes that excessive perspiration which is the basis of sunstroke if sufficient fluid is not taken in constantly. Not only is there a lesson for the big men in the tropics, but one for all others, too.

**Dreadful sanitary advice as to sunshine** is that found in the *Dietetic and Hygienic Gazette* of recent date. After quoting some authorities as to the desirability of sun exposure, the editor, Dr. J. W. Wainwright, of New York, says "we are content to leave the wisdom of an abundance of sunshine for man, whether sick or well, to the judgment of all medical men as well as sanitarians and teachers of hygiene. Let us go out into the sunshine." A multitude of Philadelphia people took this deadly advice

on July 19, 1907, and about 3,000 of them collapsed. The number of deaths will never be known. Incidentally it might be remarked that this is not the best climate in the world for all of us, and the man who thinks he can expose himself to it, is simply a fool. The medical profession is partly responsible for the terrible disaster during the Elks parade, for they have been long preaching the advantage of exposure to the sun's rays. Unlimited sunshine is advised and Tyson says of the tuberculous, "the temptation to sit in cool shady places should be resisted," and even Osler says they need "a maximum amount of sunshine." They surely got it on July 19, but they did not resist the desire for a cool shady place very long.

**Nitrogen starvation as a cause of tuberculosis** deserves much more attention than is given to it. The fact is well known that, other things being equal, those whose nitrogen foods are deficient are much more liable to contract the disease than the well fed. Even obese alcoholics are frequently victims, for they are often underfed as far as the nitrogenous foods are concerned. It is a disease of physiologic poverty, and, of course, is most often seen in the poor, who are the very ones subjected to the main factor of overcrowding in hot smelly rooms. But even the rich man is often dangerously underfed—starving, indeed, in the midst of plenty. He is an illustration of the well-known fact that man can live in apparent health for many years on an amount of proteid food far less than Voit's classical 118 grams—but when infection comes the man perishes.

**The nitrogen question** is thus a very important one. Professor Chittenden, of Yale, and many others have proved, by elab-

orate experiments, what the Chinese coolie has proved practically for thousands of years—that life can be sustained on very little nitrogen and that nonnitrogenous foods may be depended upon to furnish energy like a locomotive. There was once a universal belief in the theory of Liebig that proteid foods furnished our main, if only, supply of energy and that the nitrogen excretion was proportional to the work done. When we learned it was not true, the pendulum swung too far, for it was asserted that nitrogen foods were not intended to supply any energy and could safely be reduced to 25 or 50 grams for the small amount of repairs needed. It is known that salmon do not feed when running up rivers to spawn, but live on their own proteids which furnish the needed energy, and the same process occurs in underfed man, not only in health but particularly in fevers.

**Nitrogen starvation is dangerous**, for it reduces resistance to disease. It has been said that the soldiers upon whom Chittenden experimented were in a very bad condition when he got through with them. They threatened to desert the army unless they were put back on normal food. Some of them claim to have been badly damaged. Their pictures show them to be in an unwholesome, unnatural condition of training which is known to be followed by exhaustion. Coolies, similarly treated, are exhausted, too, and simply melt away from epidemics which are harmless to the "overfed" Europeans among them. This new scientific fad asserts that man has been eating wrongly for thousands of years; we hope there will soon be a return to reason. The sedentary professor glued to his desk chair needs little food for energy or repairs, but the active young man needs much. The food which has kept the race alive for

millenniums is the proper one, and not the food which will barely sustain for a few months. Chittenden's<sup>1</sup> suggestion, that excess of nitrogen may be a cause of susceptibility to tuberculosis—and by excess he evidently means Voit's normal of 113 grams—is a most dangerous doctrine which must be vigorously combated.

**The factor of safety in foods** has also been explained by Meltzer,<sup>2</sup> who shows that it seems to be a universal law that in every species food must be considerably in excess of present needs—the surplus being stored away as a factor of safety to bridge over a future time of stress or starvation or inability to digest as a result of infection. He speaks adversely of Chittenden, of Yale, who advises a reduction of the factor of safety in nitrogen nutrition, by the consumption of just enough for our need—half or less of what we now naturally eat as a matter of the survival of the fittest eaters. It is rare indeed for one university to be identified with two unwholesome advisers, such as Chittenden and Anderson, whose advice on athletics is so misleading.

**Another legal definition of the practice of medicine** has come from the Supreme Court of New York, and this time it is in refreshing contrast to that of Justice Duell, of *Town Topics* notoriety. It will be remembered that Duell decided that a physician did not practice medicine unless he prescribed drugs, and in that respect he did not show the mental breadth of an American Indian to whom any thing good for him is "good medicine" whether it is a drug or a suggestion. An ordinary swindling quack was convicted of illegal practice, and appealed with the audacious plea that as he

did not prescribe medicines he was not practising medicine. His plea was promptly brushed aside, the court holding that "medicine" is a word with a well-accepted broad meaning, and that surgeons, consultants and others whose very position or duty prevents them prescribing drugs, are practising medicine for the cure of disease and defect. It is hoped that the other quacks will be similarly checked in their swindling.

#### **Badly Worded State Medical Laws.—**

It is said that in some States the law does specify the giving of drugs as an essential of medical practice. We are inclined to believe that if all judges were as sensible as this court, the laws would not be given such an imbecile and narrow interpretation even when the word drug is used. The evident spirit of a law invariably infuses proper meanings into words used improperly, and our highest court has often so held. Again the progress of time changes the meanings of words, so that literal interpretation of old laws is often bad law. It is quite likely, that if a broad-minded judge would ignore pettifogging in these States, satisfactory decisions could be made from the present laws. Public policy should also be invoked, for it is quite evident that by narrowly adhering to the letter of the law, public health and morality are distinctly damaged.

**Japanese military sanitation** does not shine out in nearly so good a light as it did at first. Indeed they, themselves, were astounded at the high praises showered upon their methods, and have evidently attempted to explain the matter in accordance with the encomiums. Such modest acknowledgment of great achievement is very touching. It will be remembered that in wars, the deaths by disease are usually four times as numerous as those by wounds, and that the cause

<sup>1</sup> New York Medical Record, October 25, 1905.

<sup>2</sup> Science, March 29, 1907.

is the sudden concentration of masses of men without means of removing their excreta. A somewhat large percentage of deaths by infection is unavoidable by the very conditions of campaigning. The same, or worse, would occur in a city if the use of water and sewer pipes were suddenly discontinued. In short, bloody wars few have a chance to be killed by disease, in long wars or those of few battles, such as our Spanish war, few have a chance for death by bullets. Circumstances other than sanitation, therefore, vary the relative numbers of the two kinds of deaths. When it was first reported that the Japanese deaths by disease were only a fourth of those by bullets, it was at once assumed by the Japanophiles that the Jap sanitarians were sixteen times more successful than our own military surgeons. It now appears, from the published reports of military attaches, who were with the troops in Manchuria, that neglect of sanitation was notorious, and the absence of great epidemics was due to two factors—the wide area over which the soldiers were spread by necessity, and the frequent moves they made. Moving armies are healthy because they run away from their own poisons.

**The Japanese deathrates** will never be known. Not only has the strength of the field armies never been divulged, but the total and proportionate numbers of sick and wounded are so diversely and curiously stated that no one can make head or tail of the figures. Nevertheless, the available statistics do not bear out the early reports. The sick record was not so very good after all. What is more to the point, the record of the killed in action is apparently very high. The Japanophobes now have their turn, for it is hinted that many times as many soldiers were slaughtered as need have been. It was merely oriental semibarbar-

ism which has a supreme contempt for human life and spends it regardless. The birth-rate is so great that losses of population are soon repaired—indeed a weeding out is not considered an unmixed evil. Consequently the generals will order bloody movements for which an aryan commander would be dismissed in disgrace. Strategy would have accomplished the results bloodlessly. It was not good sanitation but oriental slaughter which reversed the death-rates.

**Nothing New has been Learned from the Japanese War.**—The attaches report that the tactics were all copied from well-known textbooks. Nothing was invented. The publications of their surgeons are very disappointing in their childlike simplicity. They have merely copied the elements of sanitation of the occident. The masses of line officers and soldiers were ignorant of even the fundamentals. Anyone who knows the nation could have predicted that much. The reports of superhuman intelligence are pure myths. The blinking owl has a great reputation for wisdom he does not possess. We have previously mentioned the disappointment occasioned by an article by Surgeon-General Suzuki of the Japanese navy. At his visit to America he was not prepared for the encomiums on their sanitation and wisely declined to answer the questions showered upon him. He now publishes some statistics<sup>1</sup> which he assures us are reliable as they have come from the army itself. He apparently copied his data from an address delivered to the Tokio Medical Association, April 7, 1906, by Lieutenant-General M. Koike,<sup>2</sup> Director-General of the Japanese Army Medical Service.

<sup>1</sup> Journal of the Association of Military Surgeons. November, 1906.

<sup>2</sup> Royal Army Medical Corps, December, 1906.

**The most recent Japanese military statistics** are evidently used by Suzuki. He says that though the war lasted but twenty-one months, there were twenty-one great battles and fifty little ones, and there were 220,812 men wounded, of whom 47,367 subsequently died. Though he does not give the number killed outright nor the number of troops engaged, the figures appear to substantiate the charges of needless slaughter. In the field army there were 236,223 men sick enough to go to hospital—and that means they were very sick. The “trivial” cases treated by surgeons with the troops are not included. Even among the home troops there were 97,850 admitted to hospital, which is not a good record at all for home sanitation. When it is considered that American army statistics of the sick include every case excused from even the least part of his duty, and that the serious cases are but a small proportion, these Japanese figures are a confession of a serious amount of disease. Suzuki states that one-fourth of the cases were beriberi—a preventable disease. The early reports that it was not common or was even absent, were pure inventions.

**Asia is a Land of Myths.**—We must accept everything from the orient with a grain of allowance—even Suzuki’s assertion that an apothecary has invented a perfect sterilizing filter, for such a thing seems impossible. No doubt the wagons for boiling water deserve examination. The oft repeated assertion that the Japs used very little food has been shown to be false, and Suzuki says that the soldiers had an extra ration every day the hard duty lasted more than eight hours. We will find that they are human, after all, and must eat if they work. We could have denied the superhuman reports off-hand, but it is better to deny them from Japanese data as far as possible. There is

nothing published to comfort the Yale school of food economists. Nitrogen is needed in Asia as in America and the Japs are not exclusive rice-eaters as generally supposed.

**The ratio of deaths by wounds and disease** is reported to be 1 to 0.37, as compared to the ratio of 1 to 1.8 in modern European wars. Suzuki rejects the accepted ratio of one killed to four dead of disease as asserted by the Japanophiles, but he has taken the cue quite nicely and states that the deathrate from disease, by the above comparison, is only one-third that of European wars, not one-sixteenth. The few figures he presents warrant the assertion that the deaths by disease were practically the same as in every war, but that the killed were three times as numerous as in European wars. Thus vanishes a myth whose very existence has been inexplicable.

**Electrotherapeutics** has been forced upon the attention of the French Association for the Advancement of Science and this learned body has gravely decided that the subject deserved further study. It appears that this wise conclusion followed a claim that high-frequency currents properly applied are capable of checking arteriosclerosis by reducing arterial pressure. As a rule, the medical profession is competent to attend to its own affairs and is generally considered expert in its own sphere, but it is a new sensation to have other scientists refer back a new proposition with a view to further investigation. Perhaps this is a polite French way of asserting that the electrotherapeutists do not prove their claims scientifically and if this surmise is correct we cannot take offense. If there is any branch of medicine—omitting, of course, the malodorous testimony expert

and the alcohol controversy—which needs scientific proof in place of dogmatic assertion, it is electrotherapeutics which is so intangible and yet so tangled. The spanking is well deserved. Cold scientific reasoning is sadly needed in place of the mysticism which is the basis of the great majority of the absurd claims for “electricity,” which has been suggested as a cure for about everything, from neurasthenia, which it really causes, to urethral strictures and it is the stock in trade of a horde of quacks. A house cleaning is needed. Works on the subject should eliminate every assertion which is not proved, and “post hoc ergo propter hoc” should be in mind in every alleged cure. Mysticism should have no place in it, no matter how much it appeals to the patient’s imagination.

**The therapeutic uses of electricity** are mentioned in a short article by Dr. Toby Cohn,<sup>1</sup> of Berlin. A feeling akin to amazement is produced by his statements of how little we really know about the effects of the numerous forms of electricity. In fact, he thinks that in some cases suggestion explains the results. He shows that some of the statements as to the effects upon metabolism are not true at all. The whole subject apparently needs clarifying in a scientific manner. There is room for experimental proof of the enormous number of claims as to the usefulness of electricity in disease. The literature is vast, but it now seems from Cohn’s short article that *post hoc, ergo propter hoc* has been the guiding principle. The society of electrotheraputists has a great field to clear up. There has been an enormous use of electricity by quacks who play upon the mysticism inherent in every patient, and electricity appeals to our mystic side.

<sup>1</sup> Archives of the Röntgen Ray, Feb., 1907.

## BOOK REVIEWS.

**Materia Medica for Nurses.** Including Therapeutics and Toxicology.—By GEORGE P. PAUL, M.D. W. B. SAUNDERS COMPANY, Philadelphia and London, 1907.

This book is dedicated to the late Everard D. Ferguson, of Troy, in admiration of his great talents and in remembrance of many acts of kindness shown to the author. The name of Dr. Ferguson is sufficient to gain for one who has been his pupil, and who reveres his memory, a sympathetic hearing. If it is necessary to teach materia medica to nurses we know of no book which is better for the purpose. It is well printed, well arranged and the statements are sufficiently dogmatic and compendious. We confess, however, to the old-fashioned belief that nurses should be nurses, and not physicians, and that the less they know about materia medica, the better, except insofar as it is necessary to make them careful about giving poisonous drugs or poisonous doses, and to familiarize them with the emergency methods of treatment for poisoning. They will not then feel that they are called upon to prescribe or to suggest symptoms as the result of drug action, or to do anything but follow the directions of the attending physician.

**Manual of Operative Surgery.**—By JOHN FAIRBAIRN BINNIE, A. M., C. M. Third edition. P. Blakiston’s Son & Co., Philadelphia, 1907.

This manual could be well termed the surgeon’s “Handbook” since the material is intelligently condensed and placed before the reader in excellent style. Binnie does not describe a single operation as the only method for procedure, but several, so that the surgeon may use his choice. In this edition, he has inserted a description of a few classic operations on the genitourinary apparatus and the anus. Many sections have been revised and enlarged and so far as possible brought up to the time of publication, making it a volume of 717 pages with many new and original illustrations. The author does not mention amputations, bone or joint operations, for which he rightly apologizes in his dedicatory letter.

**Eye Injuries and Their Treatment.**—By A. MAITLAND RAMSAY, M.D., Ophthalmic Surgeon, Glasgow Royal Infirmary. The Macmillan Co., New York, 1907.

In view of the urgent necessity of proper knowledge of intelligent first aid in ocular injuries, Dr. Ramsay’s work will be a most welcome addition to the library of the general practitioner as well as to that of the specialist. The work is based on a series of lectures delivered in connection with post-graduate work. Their scope is purely clinical, and only observations and methods of the treatment associated with actual bedside work are given. The most distinctive feature of the work is the inclusion of numerous beautiful photogravure plates and colored illustrations, quite rivalling in every way

those seen in the author's wellknown "Atlas of External Diseases of the Eye." As the book deals largely with treatment there are given chapters on Ocular Therapeutics and General Directions for Operations on the Eye. The formulas in use at the Glasgow Ophthalmic Institution are included. It is seldom the pleasure of a reviewer to commend such a valuable and artistic work on ophthalmology.

**Muscles of the Eye.**—By LUCIEN HOWE, M.A., M. D. In Two Volumes. Vol. I. New York and London: G. P. PUTNAM'S SONS, 1907. Price, \$4.25 net.

In the first volume of his work, Dr. Howe clearly shows the encyclopedic and monumental labor he has undertaken. The objects of his studies are to collect data from the enormous amount of literature on this subject, separating and as clearly as possible demonstrating facts from purely theoretic statements; to formulate these facts concisely, and in the simplest terms possible; and to supply at least a few of the data which are needed to correlate our anatomic and physiologic knowledge with our clinical experiences. While necessarily much of the text is of a technical nature the author has constantly in mind the practical aspect of the subject. The comments based on former original studies give added interest and authority to the text. Many of the illustrations are from original drawings. A most complete bibliography is added. In the foretelling volume the main subjects discussed are anatomy and physiology, including instruments for testing and methods of measurement.

**Text-book of Ophthalmic Operations.**—By HAROLD GRIMSDALE, M.D., F. R. C. S., and ELMORE BREWERTON, F. R. C. S. Chicago: W. T. Keener & Co., 1907. Price, \$5.00 net.

This is a concise yet comprehensive handbook of the most important operations in ophthalmic surgery. Beginning with general remarks relative to surgical anatomy and applied physiology, of the parts involved, the different operations are discussed in detail. Proper credit is given to originators of the operations, and critical comment is interspersed throughout the descriptions. Complete bibliographic references are added. Numerous black and white cuts are employed, and though many are rather crude, they serve satisfactorily to show the different steps in the operations, instruments employed, etc. The authors have succeeded in presenting systematically and thoroughly much valuable information in a convenient handbook.

**A Manual of the Diagnosis and Treatment of the Diseases of the Eye.**—By EDWARD JACKSON, M. D. Second edition. W. B. Saunders Company, Philadelphia and London, 1907. Cloth, \$2.50 net.

In the second edition of Dr. Jackson's excellent manual, many changes have been made to include descriptions of new conditions, and methods of treatment that have appeared in ophthalmic literature since the first publication of the work. The

author has wisely exercised a proper judicial spirit in the work of revision, and has not yielded to the overwhelming desire to be "up-to-date" by including things of uncertain value as purely ephemeral interest; neither has he failed to modify greatly or reverse former teaching when plainly indicated. An inspection of the corrections and additions shows that the work is quite complete to the date of issue. The excellent practical bibliography of English and American ophthalmic literature has been rewritten and conveniently arranged at the end of the text.

**A Practician's Hand-book of Materia Medica and Therapeutics,** Based upon Established Physiologic Actions and the Indications in Small Doses.—By THOMAS S. BLAIR, M. D. The Medical Council, Philadelphia, 1907.

This book can be definitely recommended. The author has taken considerable trouble to examine homeopathic and eclectic literature and to collate the recommendations made by writers of these schools with those made by physicians who owe allegiance to no narrow dogma. The result is an intelligent digestion of what may be termed empirical pharmacotherapy, of the most catholic nature. Whether or not the recommendations made are in all cases judicious and to be followed, is a question which every practitioner must decide for himself, but at all events it is useful to have at hand these clear and definite statements as to what is actually done by physicians who use drugs in various ways and believe that they get results. The author's own comment shows wide observation and a logical habit of thought.

**A Study of the Human Bloodvessels in Health and Disease.** A supplement to "The Origin of Disease."—By ARTHUR V. MEIGS, M. D. J. B. Lippincott Company, Philadelphia and London.

The author states that the human bloodvessels have not been exhaustively studied and that satisfactory information concerning their anatomy and pathology is not to be found in the existing textbooks. For this reason the book takes the form of observations or studies.

The original illustrations by the author and competent artists are well selected, beautifully drawn, and accurately described. These illustrations form a most valuable addition to the anatomical knowledge of bloodvessels. This work, although not intended by the author as a textbook, contains exact information, clear illustrations and should add much to a better understanding of bloodvessels.

**Anesthetics.**—By DUDLEY WILMOT BUXTON, M. D., B. S. Fourth edition. P. Blakiston's Son & Co., Philadelphia, 1907.

This practical manual of 400 pages has been revised for a third time and the present edition, as the author states, has been largely rewritten so as to include some account of the later researches upon anesthetics. The newer articles deal with

dosimetry in chloroform and the use of ethyl chlorid and its mixtures as general anesthetics including a review of the recent work on local analgesia and spinal anesthesia. The closing chapter gives a brief but clear account of the medicolegal aspect of anesthetics and the anesthetizer, a subject with which every physician should be thoroughly familiar. The author is to be commended on the concise and thorough manner in which the subject-matter is presented.

**Food and Diet in Health and Disease.**—By ROBERT F. WILLIAMS, M. A., M. D. Lea Brothers & Co., Philadelphia and New York, 1906.

The author has made a new departure in the arrangement of the contents of this book. Instead of discussing the various foods under the headings of vegetable and animal, he has used a more useful classification of foods to be used in health and in disease. Probably the most interesting and valuable portion of this book is that part devoted to feeding the sick. The diet lists from the Memorial Hospital, Richmond, Va., are similar to those used in other general hospitals. The thirty pages of recipes for sick diet are valuable. The chapters on food in infectious diseases are especially good.

**Medical Diagnosis.**—By CHARLES LYMAN GREENE, M. D. P. Blakiston's Son & Co., Philadelphia, 1907.

In this, the fifth of the leather-bound series of medical manuals issued by this well-known publishing house, the standard has been maintained. No more popular or useful set of books has ever been put into the hands of American medical students. The marginal notes, the full index, the large number of illustrations and the convenient form commend themselves. This book could scarcely be called a compend. It has the subject-matter of a full-sized text-book in compend form and size. The diagrammatic illustrations are well selected.

**The Practice of Pediatrics, in Original Contributions by American and English Authors.**—Edited by WALTER LESTER CARR, A. M., M. D.—The Practitioner's Library. Lea Brothers & Co., Philadelphia and New York, 1906.

This volume is intended, as intimated in the preface, to be a comprehensive and authoritative survey to date of the major division of medicine, included under the term Pediatrics. In order to make the book comprehensive, special attention and space have been devoted to those diseases most intimately associated with childhood, while those conditions that are more common to adult life, although occurring in childhood, are but touched upon. The authoritative quality of the work is indicated by the participation of such authorities as E. P. Davis, F. J. Poynton, T. S. Southworth, and others of like standing. That the subject-matter has been brought up to date, is manifested by the presence of articles on glandular fever, Dukes' dis-

ease, erythema infectiosum, cyclic albuminuria, status lymphaticus, certified milk, top milk mixtures, etc. In the section on infectious diseases, considerable and merited attention is paid to prophylaxis, and to the occurrence of typhoid fever in young children; but we regret the brevity and crudeness of the article on epidemic cerebrospinal meningitis. The section on heart disease is especially to be commended for its pathogenic and pathologic differentiations. We must note also the excellence of the illustrations, many of which are beautifully colored.

**Autointoxication in Disease, or Self-poisoning of the Individual.**—By CH. BOUCHARD, Translated, with a Preface and New Chapters added, by THOMAS OLIVER, M. A., M. D., F. R. C. P. Second Revised Edition. F. A. Davis Co., Philadelphia.

Nearly all writers on the subject of autointoxication admit that it was Bouchard who gave the theory of autointoxication its proper position in medical literature. These lectures of Bouchard, translated into English and put in book form, have had a large sale in this country, and this new edition, with its additions, should largely increase their demand. The growth of the use of intestinal antiseptics in this country is directly traceable to the influence of this book. Autointoxication is a subject of unusual interest and in no other book available is it discussed in a more intelligent and readable way than in the last edition of this work.

**Elementary Analytical Chemistry, Qualitative and Volumetric.**—By JOHN H. LONG, M. D., Dc. D. Third Edition, Revised and Enlarged. P. Blakiston's Son & Co., Philadelphia, 1906.

The contents of this text-book consist of 14 chapters on qualitative analysis and 7 chapters on volumetric analysis. In the third edition several important additions have been made. A chapter has been included presenting a discussion on reactions in solutions, in general, and a large number of simplifications in qualitative processes have been made. In the second part, devoted to volumetric analysis, several paragraphs have been added on the use of indicators, and a number of new processes have been included. The most important of these are methods for the titration of borates and formaldehyd. The book is well arranged and printed. More illustrations might be added with advantage.

**A New Schematic Eye.**—By William A. Fisher, M. D., Chicago Eye, Ear, Nose and Throat Hospital, Chicago, Ill., 1907.

Dr. Fisher has devised a "Schematic Eye" for the use of the students of the Chicago Eye, Ear, Nose, and Throat College in acquiring efficiency in handling the ophthalmoscope. The device is simple and gives a ready means of acquiring proficiency in the use of this instrument.

## CORRESPONDENCE.

## THE ATTITUDE OF CERTAIN ENGLISH FIRE INSURANCE COMPANIES IN SAN FRANCISCO.

BY

DOUGLASS W. MONTGOMERY, M. D.,  
of San Francisco, Cal.

*To the Editor of American Medicine:*—Much has been written in medical journals both on life and on fire insurance, but seldom do they treat of the concrete case. The specific instance is, however, the essential, both in medicine and in affairs. By it we really learn and, as I am having dealings with a fire insurance company, I can relate for my colleagues, my practical experience.

Shortly after the fire it became evident that a difference of opinion would arise between certain English firms having an earthquake clause, and their policy holders in regard to the settlement of fire losses that occurred during some time after the earthquake of April 18, 1906. As a matter of fact no one seems to know the exact date on which these companies claim their nonliability ended.

The Palatine Insurance Co., in which I was insured, belongs to the Commercial Union group, and consists of the Commercial Union Assurance Co., of London, the Palatine Insurance Co., of London, and the Commercial Union Fire Insurance Co., of New York. These three companies form practically one concern, and they pursue an identical policy in settling their losses in San Francisco.

The clauses on which the Palatine Insurance Co. bases its exemption from paying read, in some of its policies, that it "insures against all direct loss or damage by fire, except caused directly or indirectly by invasion, earthquake, insurrection, riot, civil war or commotion or military or usurped power, or by order of any civil authority, and except as hereinafter provided." In others of its policies it reads that, "This company shall not be liable for loss caused directly or indirectly by earthquake, etc."

Having these two kinds of policy one can see that even a punctiliously careful business man might be lead astray. Let us suppose him to have received an earthquake loss policy, instead of an earthquake fire loss policy, and to have felt suspicious of it. Would he not have been told at the office that it simply meant earthquake loss, and was really about the same thing as the "fallen building clause?" This would have been sufficient to have put his suspicions to sleep, and he would not have

investigated a new policy when it came to hand.

Before the fire, I have no doubt both clauses were simple and easy to explain. After the fire, however, they developed an intricacy that before, they perhaps had not possessed. By the present rendering the companies make these clauses to embrace practically all fires that occurred in San Francisco at the time of the earthquake, and for an unascertained time thereafter. Under them they claim nonliability for all fires which they assert would not have occurred but for the earthquake, and they arrogate to themselves the sole right, short of the courts, to determine what fires would or would not have occurred but for the earthquake, and they practically try to throw on the policy holder the burden of proving that his fire was not caused by earthquake. One can see how advantageous this would be to them.

In a document issued some time after the fire these companies denied liability so sweepingly, that many thought that they ought to go out of the ordinary fire insurance business, and take only such risks, for instance, as Moses' burning bush, that burned, yet was not consumed. In spite of the negative character of this document, I, on receiving a request to appear at the office, went in a rather sanguine frame of mind. Many circumstances contributed to this, for my losses had occurred long after the earthquake, and were situated far up town. The companies had also made special points in regard to available water and the presence of firemen. Firemen, I knew had been present, and a neighbor's house, a few feet from mine, had been saved by water managed by the city fire brigade. In fact the large westward portion of the city was saved by the use of water in the hands of firemen in this very locality. These two last factors of firemen and water were not essential, although the companies insisted on them, for no insurer is required to furnish them either by law or in the contract. Bouyed up, however, as I was, they soon administered some cold drops of modesty to ally my skipping spirit. I was bluntly told that they were not liable for the fire loss, that they did not owe me a cent, but that they would give me, as a "gratuity," 75 percent of the face value of my policies. That if I wished to get more I could sue for it, and that, in the event of my suing, they would withdraw their offer of a gratuity of 75 percent. I then learned that they had districted the city into a 50 percent and a 75 percent district, and that my

loss fell in the 75 percent district. This restricting of the city was wholly new, was not indicated in the remotest way in their policies, and was entirely arbitrary.

It must always be borne in mind that the earthquake loss was no factor in my case, and was not at all insisted upon by them.

On going to the office to learn about my claim it struck me that the adjusters and others had a glib way of saying, "If there had been no earthquake there would have been no fire." It sounded trippingly like the refrain of an operetta, and as if the men had been trained. The iteration of it was irritating, and although it sounded plausible, it was, of course, fallacious, for other cities such as Chicago, Baltimore, Boston, and Toronto have had large fires without the intervention of an earthquake. It looked like another attempt to put the policy holder on the wrong side of the contention.

The companies indicated to me that the contract read, as between myself and them, that they were not liable for any loss "occasioned by or through, or caused directly or indirectly by earthquake," although I find the "occasioned by or through" part of the clause is not in my policies. This inference that "occasioned by or through" was present in my policies was, to say the least, not candid, as it would broaden the scope of the earthquake clause, and would aid them in creating the impression that I would have to prove that my loss was not caused by earthquake, which would be a most bewildering outlook in such a large fire.

During my entire residence in San Francisco I had never, up to the recent disaster insured against fire in any other company than the Palatine, and when the fire came I had seven policies in that institution. Subsequent to the conflagration my lawyer asked if the great loss I had sustained, and the disproportion between my actual loss and the amount of my insurance would secure me especially lenient treatment. He was told it would not, and furthermore we were informed that we would have to settle for all policies or none, and that they would not settle one or two policies, and allow the others to go to arbitration or suit. In this way they punished me for my reliance upon them, and for insuring only in their company.

When I first insured in the Palatine Insurance Co. it was an independent concern, and my insurance was always attended to by one of its own agents. I dealt directly with

this company, and supposed, until after the fire, that I was continuing to do so. Then, for the first time, I discovered that the Palatine had been sold in 1901 to the Commercial Union Assurance Co., of London. This erroneous idea that I was all along dealing with the same company was a natural one to fall into, for the name of the company on the policy remained the same, the general appearance of the policy both externally and internally remained the same, and the agent remained the same until his death, when his work was taken up by his widow. Up to the time of this purchase the Palatine had always used the New York standard form of policy. The old policy holders were not informed, so far as I am aware, that, in reissuance of insurance the new management had put in the word "earthquake," and of course we were not warned of the significance it might assume. On this point I have made particular inquiry, but could not ascertain that any warning had ever been given the old policy holders, not even to those who dealt direct with the company.

We paid the same premiums in these companies as we would in a dollar for dollar concern, and the community esteemed their policies as being as good as the best, and they proclaimed themselves as being as good. This was before the fire. Subsequent to the fire the local manager of the Commercial Union group applied to the San Francisco Board of Underwriters for permission for the companies having an earthquake clause in their policies to charge a premium 20 percent below the board rate. This would seem to be an acknowledgment by them that these policies are less valuable than those not having such a clause, yet our money was taken and no hint of this was given before the fire.

The liberal use made by this company of this technicality ought to be a warning that when a fire insurance company evinces a taste for technicalities, the conditions embodied in their policies are so intricate and so numerous, that a clever lawyer can always fish one out and dress it up for use to resist payment. I am not a lawyer, and therefore do not know, but possibly other conditions in the policies of these companies might have been selected, but the earthquake clause seems to have been the most available.

Finally, I considered the strongest point they made against me was that they held the money, and I was in the position of the man who wished to get it. I admit this argument

appealed to me, as all medical men know how hard it is to collect from an unwilling debtor.

A medical man is peculiarly dependent on the companies having different forms of insurance. He is usually a man whose income, however large, is eaten up by his expenses. He is not like a merchant, and does not know the news of the street, and being suspicious of ordinary investments, he relies on the insurance companies. He increases his life insurance from time to time, takes out accident policies, and insures his instruments and personal belongings, without which he is helpless in deed. On meeting misfortune he requires prompt and full relief, and is usually unable to withstand the delays, the expense, and the worries of a lawsuit. To recover my insurance I shall have to bring suit, and fortunately I shall be able to stand the delay.

### PROPER MEDICAL LEGISLATION.<sup>1</sup>

BY

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of Burlington, Iowa.

The report of the autopsy upon the Minnesota Medical Bill, which you have reprinted from the *St. Paul Medical Journal*, should prove interesting to every one who has the good of the profession at heart, and particularly those who see so much good to be done by *proper medical legislation*.

We have in Iowa a supposedly good medical law: A diploma showing four years of study, and an examination by the State Board, are the essential requirements. The practice of medicine is defined, and severe penalties are inflicted for practising without a license. Yet there are good men in the profession who ask "Cuibono?" They point to the fact that in order to get such a law enacted, we have to admit in public, after long denial in private, the claims of the homeopaths and eclectics to scientific standing. They point to the fact that osteopathy (whatever it is) has been able to secure practically as good a standing. They declare that when an attempt is made to enforce the penalties for infraction, the law is openly condemned by the press and public, and frequently lacks the sympathy of the court.

Against criticisms such as these it is difficult to make headway. I have wondered if more might not be accomplished by a change of base.

For instance, why not bend our energies to secure legislation along the following lines:

(1) A broad and scrupulously exact definition of what constitutes the practice of medicine.

(2) The title of doctor, and the right to collect fees for medical services, to belong only to those who have fulfilled the following requirements:

(a) Four years of study in a medical college (diploma not essential).

(b) An examination by the State Board on anatomy, physiology, chemistry, materia medica, pathology, the principles of surgery and the principles of obstetrics.

(c) Evidence of good character and the age of 21 years.

(3) Registration, the register to be posted in a conspicuous place in the court house of the county of residence.

(4) Adequate penalties for illegal practitioners on the basis of cheating by false pretense.

Legislation of this character may not cover so many points as that which has heretofore been desired, but it seems to me would largely disarm the critics. It makes no mention of the practice of medicine as a subject for examination for two reasons, namely: It is reasonable to infer that a person who has sufficient knowledge to pass the examination in the other subjects would be able to make proper application of this knowledge (no two doctors practise alike anyway); and reference to the regular, the homeopathic, the eclectic and all the *isms* in medicine would thereby be avoided. It is worthy of note that legislation naming the different schools to be recognized, is not wholly free from the charge of unconstitutionality on the ground of class legislation. It is also possible that avoidance of these names might serve to relieve the public mind of any suspicion that there could be a combination of the schools for the sake of revenue. Let us strive for something that everybody can respect, or abandon the question entirely.

### More Milk Inspectors for New York.—

The Department of Health has asked for \$175,000 for the employment of 100 additional milk inspectors and four more supervising inspectors until the end of the year. The milk supply of the city comes from between 30,000 and 40,000 farms in six States and from 600 to 700 creameries which gather the milk from the farms.

<sup>1</sup>Republished from *American Medicine* of May 25, 1901.

## ORIGINAL ARTICLES.

### SURGERY OF THE GALLBLADDER AND BILE DUCTS.<sup>1</sup>

BY

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The surgery of the gallbladder and bile ducts is now receiving a great deal of attention in medical literature and its importance warrants its being classed with the older and more familiar divisions of abdominal and pelvic work, namely, that of intestinal operations, appendicitis, and ovarian and tubal disease.

In this paper I shall consider only those diseases of the gallbladder and bile ducts which most frequently require surgical intervention and which are most commonly encountered. In order to understand more fully the procedures generally employed a brief review of the anatomic points in the upper right quadrant of the abdomen is essential.

*Anatomic Relations.*—We know that the liver is situated in the right hypochondriac region, and extends across into the epigastric region in the adult, but in the child it also occupies part of the left hypochondrium. Roughly speaking we may consider the liver as hiding under the right lower ribs, its lower border corresponding to the free edge of the chest wall, while in front it crosses the epigastrium to the left side. In woman the liver lies much lower than in man.

Situated on the under surface of the right lobe of the liver lies the gallbladder, which extends from near the right extremity of the transverse fissure to the anterior free margin of the organ. The gallbladder is frequently misplaced and it is not at all uncommon for the surgeon to discover it far removed from the classic position at the tip of the ninth rib.

This malposition of the gallbladder may be due to one of many causes, as, for example,

<sup>1</sup> Read before the Buffalo Medical Clinic, February 7, 1907.

in cirrhosis of the liver the gallbladder is carried up well under the ribs, while in abscess of the liver, or empyema of the right pleural cavity the gallbladder is found at a variable distance below the free border of the chest wall; adhesions also cause its malposition.

*Function of the Gallbladder.*—Opinions differ as to the function of the gallbladder. Murphy considers it a regulator of the tension within the biliary passages, others consider it a reservoir for bile. It is sometimes completely absent in man, as it is normally in many of the lower animals.

Two gallbladders have been discovered in exceptional cases, each bladder being provided with its own cystic duct.

The size of the healthy gallbladder is about four inches in length, one inch in width, and holds from 8 to 12 drams but the diseased bladder varies in size from that of a child's head down to the contracted gallbladder seen in chronic cholecystitis which, in some instances, is no larger than a marble.

It is not necessary to give the anatomic structure of the gallbladder in detail, but it is sufficient to state that it is made up of a mucous membrane, a muscular layer, and a serous layer. The mucous layer is very richly studded with glands which secrete mucus. It is divided into a fundus, body, and neck. The body of the gallbladder is in relation, by its upper surface, with the liver, to which it is connected by areolar tissue and vessels, by its under surface with the first portion of the duodenum, and occasionally with the stomach and colon. When the gallbladder is distended sufficiently with bile or calculi, the fundus may, in emaciated subjects, be felt through the abdominal parietes. It cannot be felt in health even in very thin subjects.

As a congenital malformation or an acquired deformity the gallbladder is not uncommonly found to be hour-glass shaped, the distal portion containing calculi, and communicating by a narrow neck with the cyst proper. A case in which there was transposition of viscera is related in the *Annals of Surgery* for May, 1899, and as the patient was the subject of gallstones,

cholecystotomy was successfully performed on the left side. If the gallbladder is removed and the cystic duct allowed to remain, it may, in some cases, dilate to take the place of the removed gallbladder.

Examination of the gallbladder should be made in all cases in which the abdomen has been opened for any cause, as valuable information may be obtained and conditions discovered which had not before been suspected.

*Cholecystitis*, or inflammation of the gallbladder, may be of various degrees of intensity. Like appendicitis it may be catarrhal, suppurative, ulcerative, and phlegmonous, corresponding to the virulence of the infection. Gangrene of the gallbladder is but rarely observed, on account of its free blood supply through the cystic artery, and vessels reaching it from the liver.

The causes of acute cholecystitis are of two kinds, (1) disposing, and (2) direct or exciting. The disposing causes are, any factors which reduce the resistance of the gallbladder, as, (a) a previous attack; (b) calculi; (c) foreign bodies, as worms; (d) any factor leading to biliary obstruction in the gallbladder. In other words, all factors which favor the production of catarrh of the gallbladder and bile ducts, predispose one to cholecystitis. The direct or exciting causes are, (a) microbic infection of the gallbladder; (b) traumatism of the gallbladder.

The germs most commonly found are, the colon, typhoid, and dysentery bacillus but there may also be present at times, staphylococci, streptococci, or pneumococci.

The principal symptoms are pain and tenderness, and these are usually limited to the region of the gallbladder. The pain may be mistaken for gastric pain even though located in the right hypogastrium. The pain may be severe and colicky in character and extend to the back and right shoulder-blade. Jaundice is absent or slight, fever usually present.

Under the influence of inflammation the gallbladder dilates, and as a result, we get a palpable tumor. If there are no adhesions binding it down, the cyst can readily be moved in all directions and it cannot be held down during experi-

mentation as can a floating kidney, or a tumor of the stomach, intestines, or omentum.

This tumor formed by the distended gallbladder may be so large that it may easily be mistaken for hydronephrosis, cyst of the ovary, or echinococcus cyst of the liver. It contains either a pure serous fluid or a mucopurulent or purulent fluid.

Aspiration of the gallbladder to determine the nature of its contents is under no circumstances justifiable, before the abdomen has been opened. If the cholecystitis spreads to the serous coat of the gallbladder, a pericholecystitis develops, causing adhesions and kinks.

Traumatism plays its part in the production of cholecystitis. Instances in which severe exertion has been followed by pain in the region of the gallbladder, and in which at operation some time later extensive adhesions, due to an acute cholecystitis or pericholecystitis, have been found. A mistake which is very easily made is to regard a case of cholecystitis as one of appendicitis. This may be due to a displacement downwards of the liver, or an elongated gallbladder, or sometimes to the presence of peritoneal adhesions between the two organs.

The treatment of the catarrhal variety is rest, suitable diet, and medicine; the chronic and simple empyemas and suppurative cholecystitis require surgical interference either in the form of cholecystenterostomy, cholecystotomy, or cholecystectomy. The spontaneous cure of cholecystitis by the complete discharge of calculi through the cystic and common ducts into the duodenum rarely occurs, therefore surgical intervention is usually required.

*Cholelithiasis*.—The presence or formation of gallstones, whether in the ducts or in the gallbladder, is known as cholelithiasis. Postmortem work shows that ten percent of all people, some time during life, have gallstones. They are rare in warm countries and common in cold and damp districts. They are rare in negroes and the natives of India seldom develop them. They are rare in youth, commoner in middle life, and frequent in later life. Gallstones are much more frequent in women than in men; the ratio being about five to two. Many theories have

been advanced for this greater frequency in woman, among them, (1) a lax abdominal wall, favoring visceroptosis and stagnation of bile in the cyst; (2) abdominal tumors and pregnancy, interfering with diaphragmatic respiration; (3) tight lacing; (4) more sedentary life; (5) pregnancy and constipation.

The composition of biliary calculi varies considerably, but by far the most common variety is the mixed cholesterin gallstone. They are usually faceted and are generally small in size, and are usually yellow or brownish in color.

Almost any number of gallstones may be present in the gallbladder; Otto reports a case in which 7,802 stones were found. The size of the calculi also varies considerably; Meckel records a calculus which measured six and one-half inches in length and six inches thick. These very large stones are usually found to be composed of pure cholesterin, and are comparatively uncommon.

Calculi usually develop in the gallbladder, but occasionally they are formed in other portions of the biliary tract. Riedel assigns to heredity great importance in their formation. Benecke believes that atheromatous degeneration and gout play an important role in their formation. Kraus ascribes importance to rich diet and luxurious living, and Bouchard says there is a special calculous diathesis. Calculi may exist in the gallbladder without giving rise to symptoms, so long as the cystic duct is open, and no cholecystitis accompanies them. Kehr states that symptoms occur in only five percent of persons whose gallbladders contain calculi, and we all know how rarely we are called upon to treat biliary colic in the very aged. Several causes have been assigned for the passage of calculi out of the gallbladder, such as unusually vigorous contractions of the gallbladder induced by violent emotion; the onset of colic at the menstrual period; jolting in a wagon, or riding a bicycle. From the fact that so many possible reasons are advanced, I think we are forced to the conclusion that the real cause is yet unknown.

The ordinary signs and symptoms of biliary

colic are so well known that I will not dwell upon them here; but, it may at times be very difficult to differentiate it from cholecystitis, renal colic, floating kidney, gastric or duodenal ulcer, acute dyspepsia, appendicitis, angina pectoris, or lumbago.

The prognosis in cholelithiasis is good so far as the recovery from the actual attack, but it is seldom that the first attack is not followed by many more. The prognosis is materially influenced by the absence or presence of facets on a calculus found in the stool. If, after a first attack, a smooth gallstone without any facets is found in the feces, it may reasonably be hoped that no further attacks will follow. Death may occur from cardiac failure due to the intense pain, or from rupture of the gallbladder or bile ducts during severe spasm, peritonitis following from infected bile.

Physicians and surgeons differ as to the indications for operation. Some physicians advocate early operation, others delayed, and still another class insist on the late operation, or not at all till life is threatened. However, the idea of early operation is fast gaining ground, and most all now urge operation in cases of acute local peritonitis in the region of the gallbladder, perforative peritonitis, and severe, infective inflammation of the bile ducts. Frequently recurring attacks, or fear of producing the morphin habit, are also indications for operation. The operation is contraindicated in (a) acute obstruction of the common duct, the stone may pass spontaneously; (b) in very old people, or in diabetes, or in the presence of severe cardiac or pulmonary lesions; (c) extensive carcinoma of the biliary passages.

Operation during an attack of gallstone colic is never undertaken except for some severe complication, such as, (1) rupture of the gallbladder or bile duct; (2) general peritonitis due to acute infective inflammation of the gallbladder; (3) signs of acute intestinal obstruction due to volvulus from exaggerated peristalsis. In cases in which operation is indicated, the gallbladder should be opened, calculi removed and if necessary, cholecystectomy performed. Mayo advocates removal of the mucous membrane of the

gallbladder instead of total removal of the cyst, claiming good results for his method.

*Tumors of the Gallbladder.*—Benign tumors of the gallbladder are rarely seen, the papilloma being practically the only innocent tumor encountered in this organ.

*Primary malignant* disease of the gallbladder is by no means rare and is practically always carcinoma; primary sarcoma having been reported only nine times. Carcinoma usually begins in the fundus of the organ, and this is probably due to the fact that the fundus, being the most dependent, is especially exposed to irritation from the presence of calculi which are generally believed to be the cause, either by direct irritation or otherwise. In 100 cases reported by Musser, gallstones were present in 69, and Janowski reports 40 cases of malignant disease of the gallbladder with calculi present in all cases. Primary carcinoma occurs in about 10 percent of all cases of cholelithiasis.

Malignant disease of the gallbladder occurs much more frequently in women than in men, the proportion being about four to one. This may be partially explained by their greater liability to gallstones which is calculated by many observers to be three to one. As the disease is fatal unless it can be removed, medical treatment is merely palliative and surgical measures offer our only hope for permanent cure.

Statistics of operation on the gallbladder for malignant disease show an operation mortality of about 25 percent. This high mortality depends mainly on hemorrhage, which is so difficult to control in cases of chronic jaundice. If large doses of calcium chlorid are given, however, this tendency to hemorrhage is much diminished.

The prognosis of malignant disease of the gallbladder is exceedingly bad; while the operation mortality is, as I have already mentioned, about 25 percent, nearly all patients suffer from a recurrence of the growth within a few months. Surgical aid is occasionally demanded on account of traumatism of the gallbladder, but cases of this nature are very rare.

*Biliary Ducts.*—The biliary ducts are the hepatic, the cystic, and the common bile duct.

The hepatic duct commences at the transverse fissure and passes downward and to the right for about one and a half inches to join at an acute angle with the cystic duct, to form the common bile duct. The cystic duct, the smallest of the three biliary ducts, is about one inch in length. It passes obliquely downward and to the left from the neck of the gallbladder and joins the hepatic duct to form the common duct. The common excretory duct of the liver and gallbladder is the common bile duct. It is the largest of the three ducts, being about three inches long, of the diameter of a goose quill, and formed by the junction of the cystic and hepatic ducts. Along with the pancreatic duct it empties by a common orifice into the descending portion of the duodenum, a little below its middle. The biliary ducts have but two coats, an external or fibrous and an internal or mucous.

Stricture of the bile ducts is rare, excepting in the cystic duct, where it is commonly caused by cholelithiasis or cholecystitis. If found in the common or hepatic duct, it is very likely caused by syphilis, or by some congenital malformation. The treatment consists in the administration of the iodids, and if these fail, cholecystenterostomy should be performed.

Congenital obliteration of the bile ducts is not at all common, and when present is usually due to a descending inflammation which is dependent upon intrauterine cirrhosis of the liver.

Biliary fistula between the gallbladder and bile ducts, and other viscera, or the outside of the body, is generally caused by gallstones, or it may be due to previous operation on the gallbladder or duct or to malignant disease. Dilation and cystic tumors of the bile ducts occur and a retention cyst containing two or three pints of bile has been observed. Treatment for these conditions consists in the drainage of the cyst, and removal of the cause when possible.

Carcinoma of the bile ducts has been reported but a few times; it is probable, however, that this condition is not so uncommon as it is generally thought to be, and that it is either overlooked, or mistaken for some other disease. The treatment, as well as that of carcinoma of the

ampulla of Vater, is disappointing, only two or three successful cases being reported.

In cases of suppurative cholangitis from any cause, and in cases of impaction of the common duct with gallstones, it is necessary to employ immediate surgical measures. Usually but one stone is found occluding the duct, but occasionally as many as 10 or 12 may be present. The operation most commonly performed for the relief of these conditions is what is known as choledochotomy, or incision into the common bile duct. It is a delicate operation and great care must be exercised in order to close the walls of the duct securely and yet not occlude the lumen. Halsted has devised a hammer which he introduces into the lumen of the duct, to separate its walls while the sutures are placed. This he claims simplifies the operation to a marked degree. The recuperative power of the common duct is equal to that of any mucous lined canal in the body.

*Cholecystectomy*, or the operation of removal of the gallbladder, is especially adapted to those cases in which the gallbladder is so small or is placed so deeply that it cannot easily be sewed to the abdominal wall, and in cases in which the cystic duct is permanently obliterated. Cancer limited to the gallbladder, or chronic mucous fistulas, are indications which warrant this operation. However, if drainage of the bile radicles is desired, cholecystectomy is contraindicated. Of late some able men have been vigorously advocating this operation in cases of cholelithiasis and other conditions necessitating the opening of the gallbladder, claiming that it is of no more use to us than is our appendix. The gallbladder doubtless has some special function, but its removal has no effect upon a person's health or his digestion. An argument in favor of cholecystectomy where possible as against cholecystotomy is the fact that stones do reform in the gallbladder after the latter operation. A case observed in August, 1901, illustrates this point.

Mrs. A. was referred to me by Dr. Clinton Crosby, of Oswayo, Pa. She gave the following history: Married, mother of five children. For the last 13 years she has had more or less pain in the

region of the liver, at times this pain amounted to severe paroxysms, requiring large doses of morphin to obtain relief. She has never been jaundiced till the present attack, and although often sought for, no stones have ever been found in the stool. She has lost nothing in flesh, her present weight being something over 200 pounds. Her mother and aunt died from gallstones, and at autopsy on her mother, 81 stones were found in the gallbladder. About six months ago the patient had an attack of typhoid fever.

On August 2, the day following her arrival in Buffalo, I operated upon her, exposing the gallbladder and bile ducts in the usual manner. The gallbladder was found at least two and one-half inches from the anterior border of the liver, and bound tightly to it. After carefully opening the gallbladder, being cautious to protect the surrounding tissues from infection due to the escaping bile, I removed from the gallbladder, cystic and hepatic ducts, 75 gallstones, each the size of an ordinary kernel of corn; one stone, which was impacted in the common duct, was the size of a cherry.

After satisfying myself that the common duct was patent, I closed, by suture, part of the opening into the gallbladder. I then introduced a drain, surrounding it well with gauze to guard against leakage. Through the fistula formed, between 20 and 25 ounces of bile were discharged daily for two weeks, when the amount gradually began to decrease, and finally stopped. She returned to her home in Pennsylvania and after four or five months, again began to have pain in the region of the gallbladder. The pain rapidly became worse, and her husband wrote me on February 15, 1902, just six months after her first operation, that she had undergone another operation for gallstones, and that this time 45 stones had been removed. Had it been possible to remove this gallbladder without seriously injuring the liver, I should have done so, and the woman would have been saved the necessity of a second operation.

A case illustrating the small amount of pain present in some cases of cholelithiasis is as follows:

On October 17, 1903, I was asked by Dr. W. E. Dignen, to see Mrs. M., aged 38. She is the mother of four or five children, has always been well, and never had any pain referable to the gallbladder till two weeks ago, when she was taken suddenly with a dragging sensation and feeling of great discomfort in the abdomen a little to the right of the umbilicus. Her tem-

perature was 99°, pulse 85, tongue and mouth dry, and she was very thirsty. A tumor the size of a kidney could be felt through her very fat abdominal wall. She had never been jaundiced. I advised operation after the acute attack had subsided, and about two weeks later opened the abdomen and found an enlarged gallbladder, the walls of which were three-eighth inch in thickness, and contained 113 gallstones, 110 being the size of a kernel of corn, and three the size of an ordinary hickory nut.

I did a cholecystectomy, and the patient made a prompt recovery.

The operation of *cholecystostomy* is very common, and consists in the opening of the gallbladder for the removal of its contents, and then draining the bladder through a more or less permanent opening. Sometimes a troublesome sequel of cholecystostomy is the formation of a biliary fistula which is usually caused by obstruction of the common duct, by reason of a calculus or by pressure from malignant growths. The treatment of this troublesome complication is, removal of the cause if possible, or, cholecystenterostomy affords the best results. This operation is usually performed with the Murphy button (modified for the purpose), or the union can be made by sewing, the same as in intestinal anastomosis, and consists in the establishment of a biliary fistula between the gallbladder and the intestine, for the relief of cholemia due to closure or destruction of the common duct, chronic fistula, chronic cholecystitis, etc. The deathrate following this operation is still very high, being 14 percent in cases in which the button is employed, and 35 percent in cases in which other means than the button are used.

*Cholecystotomy*, or surgical incision of the gallbladder, is the simplest of all operations on the biliary passages. Its field of usefulness is very limited, being applicable only to those cases in which the ducts are unobstructed, and in which no infection or peritonitis is present. I think it far safer for the patient if the abdominal wound is but partially closed at the time of operation, leaving a small opening in the abdominal wall through which a drain is inserted down to the wound in the gallbladder. This is removed in a few days if no leakage occurs,

and cure has not been materially delayed. The following case illustrates this:

August 21, 1905, I was asked by Dr. John C. Thompson to see Miss C., aged 28, living in Medina, N. Y. She had been well until the day before, when she was taken suddenly with severe pain in the abdomen. She called a physician who gave her a hypodermic of morphin but it did not relieve her pain. A diagnosis of probable appendicitis was made, and she was placed on a cot and sent to Buffalo at 11 p. m. I saw her the same night, and found her temperature 98.5°, pulse 136, respirations 28. Her abdominal muscles were rigid, and the spot of greatest tenderness was over the appendix. She had no jaundice and was very constipated. No tumor could be detected through the rigid abdominal muscles.

Operation being thought advisable, the patient was prepared, and assisted by Dr. Thompson, I made an incision over the site of the appendix and found it acutely congested, but not giving enough evidence of trouble to explain her condition. I removed the appendix, and then made an examination of the gallbladder, finding it the size of a bologna-sausage, filled with mucus and bile, and two gallstones each the size of a large hickory nut. One of these stones completely blocked the entrance to the cystic duct, preventing any escape of the contents of the gallbladder. Enlarging my incision slightly, I opened the gallbladder and removed its contents. After satisfying myself that the biliary ducts were not obstructed, I closed the opening in the gallbladder in the usual manner, and but partially closed the abdominal incision, leaving a drain down to the gallbladder. Bile escaped through this opening for five days, when it stopped and she made a good recovery, going home at the end of two weeks. I heard from her a short time ago and she has had no return of her former trouble. Had I not drained in this case I feel certain serious harm might have occurred.

This case is but one of a series of cases in which I introduced a drain through the abdominal wound, and I have never had reason to regret having taken this precaution.

*Cholecystolithotomy*, or the operation of exposing the gallbladder and crushing the calculi by fingers or forceps, and forcing the fragments through the cystic into the common duct, is not a wise procedure and is very rarely resorted to. Personally I have had no experience with this method of operation.

*Parasitic affections* of the bile ducts occasionally occur and are usually seen in children. The *Ascaris lumbricoides*, or round worm, sometimes works its way from the duodenum into the common bile duct and causes biliary obstruction and infection of the ducts. The most common symptoms of this condition are, enlarged liver, fever, jaundice, and attacks of biliary colic. The diagnosis depends on detecting the worms or their ova in the dejecta. The treatment consists in the administration of santonin in cases in which round worms are suspected, and if this fails, and signs of infection arise, choledochotomy should be resorted to.

In this paper I have briefly mentioned some of the conditions in which operations on the gall-bladder and biliary ducts are indicated, and have purposely omitted giving the technic of the various operations, inasmuch as this can be found in all standard textbooks on surgery.

## DEMENTIA PRÆCOX: CLINICAL STUDY OF SIX CASES WITH SPECIAL REFERENCE TO THE TREATMENT OF THE DISEASE.

BY

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The period of life between youth and adult age, called adolescence, seems in many cases to be a veritable "Valley of the Shadow of Death" as described in Bunyan's "Pilgrim's Progress." In it the pilgrim is beset by many ills that, like the evil sprites of the allegory, whisper their baleful suggestions into the youthful ears and exert their influence for evil upon the most impressionable and vulnerable period of life.

Dementia præcox is one of the most fearsome of the diseases that beset this period. It is a disease that is characterized, clinically, by a disturbance of certain or selected reasoning centers, together with more or less involvement of other centers—e.g., emotional—by which there is inability to deduce or infer correctly from certain given or selected afferent impressions, e.g., of taste, sound, sight, etc.

In other words, there may or may not be dis-

turbance of the afferent paths of sight, hearing, taste, etc., but there is present an inability to form logical or, better, normal corollaries from the mental impressions that have come by way of these paths to the brain. For example, owing to disturbance of certain centers, an overheard conversation or a fleeting facial expression of a passerby may be construed to mean distrust, deprecation, ill-will; a facial expression noted at the time of tasting something that is unpleasant (or *vice versa*) is construed to mean poison or ill-will as the case may be and so on. If there is a confusional element present then the corollaries or inferences are confused and the actions of the patient are undecided. If there is no confusion present the corollaries or inferences are logical and well-formed even though incorrect. There has been no fault in the afferent paths. The fault lies with the centers that govern the transfer from the sensory perception to the idea evolved from those impressions.

Without going into the literature of this subject it is the object of this paper to present certain clinical features in six cases of dementia præcox that came under my own observation. These cases were all closely observed from day to day over a considerable time with the object of arresting the progress of the disease, if possible, and of substituting the normal for the abnormal method of ratiocination.

The six cases represent four of the clinical divisions of dementia præcox, these divisions being more or less arbitrary, viz.: (1) Incipient paranoia; (2) acute paranoia; (3) hebephrenia; (4) chronic paranoia. This nomenclature might not find favor with all the authorities but it will serve the purposes of this paper.

Of the six patients three recovered. These patients have remained normal up to the present time—or two, three and five years, respectively. The recoveries were in the two cases of acute and one of incipient paranoia. In one case (hebephrenia) the patient recovered sufficiently to return home in excellent condition; she remained normal for months and then the disease recurred. This happened two or three times in her case. The two cases of chronic paranoia ran a pro-

gressively chronic course from the beginning and so continue.

A brief history of each case will suffice to show the nature of the mental disturbance and point out the clinical differences.

The lesson taught is that the measure of success will depend upon the kind of management instituted and the care with which it is carried out.

I wish to express my thanks to Dr. Wharton Sinkler for his permission to use the cases of incipient paranoia and hebephrenia in this series; they were placed under my care by him.

CASE I.—*Incipient Paranoia*: W. F., aged 20.

This was a young man who presented a robust appearance and showed no signs of mental or physical depression. On the other hand he exhibited the picture of mental well-being and exaltation; his ideas were rather grandiose and he patently imparted the idea of being a "good fellow," "up to snuff" and hard-to-get-ahead-of. He was very talkative, imagined himself very funny and affected the semitough vernacular. He had become unmanageable at home; doing and saying things that made him a nuisance.

Previous to the time when his commitment to personal supervision and restraint became necessary he had been very good-natured, a general favorite and anything but unpleasant. Within a comparatively short time he developed the foregoing symptoms of oncoming mental change. His previous history showed an attack of "brain fever." His parentage showed a weakly nervous mother who had always spoiled him and a strong, robust, self-made man for a father. There was no history of insanity noted in the family.

His history while under my care showed several typical episodes of a bizarre nature: Two attempts at escape from restraint, one of which being for a time successful; a night ride on a freight train; pawning of clothes; sudden changes in plans and so on. The escape and dramatic episodes following it were all unnecessary and silly but they pleased him immensely until he found out they were not attended by the solicitous attentions that he expected, on his return. At another time he again attempted escape after some petty thieving. This was attended by more bizarre methods: After the most elaborate preparations he put on two suits of clothes in order that he could make a "quick change to cover the trail." It trans-

pired that these things were done to demonstrate his ability to get ahead of his attendants rather than for any imagined wrong. Indeed, he would be delighted for hours when he had succeeded in perpetrating some unpleasant practical joke on any one about him. There was no mania, no depression, no dementia in his case; he was on the borderline of the silly and fantastic state of mind that is the beginning of an acute paranoia. He never went beyond this stage and recovered after several months' treatment.

CASE II.—*Acute Paranoia* (possibly hebephrenia): B. W., aged 19.

This was a young man whose father had died from the effects of alcoholism. His mother, though never robust, had been fairly healthy. Mentally, she was beyond the average. There was no history of insanity in the family.

The life of this young man had been free from cares and worries. He had always done well at school and his mental and moral condition had been considered excellent.

A few months previous to the time he came to me his conduct had begun to be unusual and different from what was customary with him; his answers to interrogations concerning it were that he had certain ideas for the betterment of his city and State; that it was necessary for him to see certain men of influence, etc. At one time he made several attempts to interest the governor of his State in his schemes. These, by the way, came near to meeting with, at least partial, success.

When he was brought to me he was in a state of mental confusion bordering on mania; he was uncertain whether his brother and the physician who accompanied him were trying to do him harm or not. Shortly after he arrived he became maniacal. This condition was aborted and he became talkative. He imagined that there was a mental connection between his ring and a certain young lady of his acquaintance by which he knew her thoughts. This idea originated in the sight of a long spiderweb that stretched from his window to a telephone pole. It was covered with dew and shone in the sunlight and thus attracted his notice.

After a time his condition changed. He became cataleptic and would lie for hours in the same position, saliva drooling from his mouth. At this time his face was flushed and his eyes bloodshot. For a week or more it was necessary to feed him through a tube. At this juncture he developed a rise in temperature. The change from this to the next stage of his disease was rather sudden. He began to improve; the increased temperature left him very weak

but he began to eat more of his own accord. After a time he could get about his room and would make his bed and do what he was told to do. It was about this time that he would be seized by fits of uncontrollable laughter and his facies would become satyric; this was the crucial period in which he had to be forced over the danger point by every means of suggestion and training. But under it he did progress favorably and eventually recovered. It was after this that he began and finished a course at the Drexel Institute, in Philadelphia, with credit to himself and it. In this case the diagnosis of hebephrenia might be a better one than acute paranoia.

CASE III.—*Acute Paranoia*: C. J., aged 24.

This was one of the most interesting cases of this disease that I have ever seen. The patient was 24 years old at the time of onset, the prodromal symptoms of which lasted but a short time. There was a family history of acute mania in one sister but no taint of insanity in the families of his parents.

His father was robust mentally and physically; his mother was mentally much above the average, but inclined to invalidism.

Up to the onset of this attack the young man had been normal in every respect, was interested in his work, outdoor sports and in a social way. He had done well at college and was doing well in business when he became possessed rather suddenly by unusual, abnormal ideas. When first I saw him he was in a confused state of mind and did not know what had come upon him—though he did know that his ideas were not rational.

The course of this case showed cyclic exacerbations, or relapses, associated with marked vasomotor disturbances, these phenomena manifesting themselves regularly every month (except one) for a year. Beside the periodicity of the relapses when all his symptoms were exaggerated, the clinical features of the case were a premonitory vasomotor disturbance, mental confusion, persecutory delusions and an intense mental sensitiveness. Between these exacerbations he was at times almost free from mental taint. The periods of disturbance lasted 10 to 14 days and could be foretold from month to month with accuracy. A full history of this interesting case may be found in *The American Journal of Medical Sciences*. The young man recovered fully.

CASE IV.—*Hebephrenia*: S. H., aged 18.

This was a girl whose father and mother were to all appearances mentally and physically sound, and yet there was another child beside this one

who was not normal, mentally. The father was a nervous, overworked, successful business man and the mother a rather plethoric, easy-going woman.

The young girl began to have the symptoms of mental confusion with irritability of temper; she then became obstinate and morose, alternating with fits of acute mania of the destructive type. These attacks were attended by vasomotor distention symptoms—the face becoming flushed and the eyes bloodshot. Soon her facial expression changed and became gross and at times, ferocious. Depression followed, during which she sat alone and moody; she refused food and drink and disliked to be disturbed. This phase was generally followed by a mental storm that seemed to clear the atmosphere and she would be better for a week or more. As is usual, her mental disturbance was always worse at the approach of her menstrual periods.

The delusional element was not a prominent feature. She did not exhibit grandiose ideas nor were her periods of depression prolonged more than a few days at a time. Danger signals of dementia were exhibited early in her case—inordinate laughter, satyric facies, soiling of her own person and the like.

After about three months she became much better and in time went back to her home in excellent mental condition. She remained thus for several months but later had a relapse; she could not stand the stress of the average home life. Her after-history has been one of repeated relapses.

CASE V.—*Chronic Paranoia*: H. B., aged 17.

Both the father and mother of this youth were extremely neurotic. The latter is artistic, poetical and emotional and a sister of hers had been hysteric in her girlhood; the father has ever been intensely wrapped up in business, driving himself and those about him to the limit of endurance. He was for years troubled with grave, nervous insomnia.

The patient has a first cousin that had an acute nervous breakdown a few years ago.

From childhood the patient had "been different from other children;" he would often sit silent and absent minded and have to be aroused—though his general disposition was boisterous and bold. His nature was affectionate but his temper variable and throughout his life he was subject to fits of uncontrolled passion and anger. As he grew older the abnormality of his mental condition began to be suspected—at first his parents had rather looked on him as something of a genius, though eccentric.

He was tried at various schools but was invariably expelled because he resisted authority and wilfully broke all rules. He developed a bold, wilful attitude and became very difficult to manage.

He came under my care at 17 years of age with the idea of trying what personal supervision would do for him. In some ways he did very well and seemed to try, for the first time in his life, to do as he was directed. He did fairly well when made to apply himself to drawing and languages; also, he would take the prescribed exercises that were given him. For a time some progress was made but it was only too evident that this boy was doomed. He developed ideas of dislike and distrust against his father. He imagined he could do big things if only allowed to try them. He soon became suspicious of those about him. These suspicions were quite logical, in a way, but without real foundation. He did not deduct correctly from the ideas that formed in his brain.

At one time he improved considerably and was allowed to go with an attendant to a country place in Maryland where he could have an out-of-door life and just what he had asked for; he stayed a few days and then, one rainy night, he ran away, boarded a freight train going to Baltimore, eluded the watchfulness of the Baltimore police who were instructed to look out for him, pawned his watch and arrived home at last pretty well tired out. His idea through all this episode was to elude restraint and get ahead of his father, who he thought was keeping him away from home in order to impose upon him.

Very soon after this he developed confusional symptoms and was committed to an institution where he now is after several years.

CASE VI.—*Chronic Paranoia*: F. A., aged 19.

His mother's father died of tuberculosis; her mother was gouty and rheumatic all her life. His father was tuberculous though he died of typhoid fever; he had always been considered very bright, had been an honor man at Harvard, graduated with honors from the Medical School, went to St. Paul to practice and at the time of his death he stood at the head of his specialty in that city, though under 45 years of age.

The patient was born six months after his father's death and his mother was in a critically nervous state. During boyhood his mental and physical condition were good. Brought up under the coddling influences of his mother and grandmother he was not robust enough in body or mind to be a companion for his fellows; he was a "good" boy, with gentle manners,

almost feminine, and inclined toward religious matters beyond his years.

He did not develop patent mental symptoms until about 17 or 18 years of age. They became marked while on a trip abroad. At first he imagined he would lose his soul because of a tendency to masturbate; then he had delusions or persecutions and thought the police were after him. He wrote several letters complaining of this undeserved "shadowing." At this stage there was little or no mental confusion. His arguments were logical, though without basis. Also, he could reason well enough to be made to understand that his delusion was without foundation and yet he could not shake it off.

When he came to me he was entering the confusional stage. Soon after he became very emotional and possessed by the idea that his mother had died and the event kept secret. This became so dominant that it could be classed as a "fixed idea." Even her letters failed to convince him and he became mildly maniacal. After a time it was decided to commit him to the influences of an institution. He lost weight and strength and became very despondent. His mother was sent for. When she entered his room he acted as though he saw one from the dead. It was, in fact, a most dramatic situation. For a time he would not believe his senses but cried out that it was a vision. In time, however, he became reconciled to the fact that his mother was really alive: this is the only time I have seen so deeply-rooted an idea of the "fixed" type dispelled at once; indeed, it is seldom given to one to have at hand such a chance to rebut completely a "fixed idea."

Following this the young man became better and after a time was able to leave the institution; but after a few months his condition again became such that he was sent back; he was not able to live the normal life and remains there in a negatively-contented state.

These histories are very brief and necessarily incomplete. I fear that many clinical points have been missed or left out. But the series is interesting from the standpoint of clinical observation of various phases of dementia præcox. Most of all, the lessons learned regarding the treatment and training of these kinds of patients are most valuable. The fact that three of the six recovered, although the prognosis was bad in four of them and only fairly good in one gives more confidence in doing for patients of this class.

When we approach the subject of treatment we have arrived at the important part of this subject. This kind of insanity is the most difficult to treat, and by difficult I mean the dictionary definition of the word, "arduous, not easy, vexatious." The responsibilities of one in charge of these patients are great. To make any headway in overcoming their mental condition requires, in my estimation, a more varied form of attack, more patience and perseverance, more tact and diplomacy and more strength of purpose and wisdom in carrying it through than any other form of mental disease.

It is a trite saying that every case needs its own form of treatment; and yet there are certain general rules of conduct to be observed.

The manifestations of mental obliquity in these cases are so varied, so bizarre, so obstinate so illogical, and withal so often expressed in such an apparently logical and reasonable form that it keeps one constantly on one's guard to say the right word, to assume the right tone, to know quickly when to give in and when to resist.

First of all, in a great measure, one's success will depend upon the companion that is placed with the patient. Upon this person devolves the "arduous, not easy, vexatious" task of daily and hourly substituting the normal idea, thought and action for the abnormal, illogical and bizarre; upon this person we must depend to watch the varying phases of the case and to apply the needful mental treatment for just that phase—whether it be a jest, a serious word, a look, or simply neglect. In short, the treatment will consist chiefly in a rational, business-like handling of the patient by the attendant and the carrying out by him of any supplementary treatment that may be required, whether it be drugs, diet, massage, or exercise. Of course the patient must not be placed in the hands of an attendant and then allowed to drift along at the will of that attendant (and this is too often done). The physician in charge must have a carefully planned system of attack and he must impress upon his patient and attendant the necessity of absolute obedience. And just here is where some men are so

eminently fitted to handle just this kind of cases—for more depends upon their manner and personality in such cases than in general internal medicine, surgery or even other forms of nervous disease except, possibly, hysteria.

Having chosen the suitable companion for the patient, it becomes necessary to plan the method of attack. An incipient paranoia, for instance, needs a firm hand and, at times, a heavy one. If he has a disposition that revels in unnatural forms of cruelty, mean practical jokes, destruction of property and the like, he will need all the firmness at one's disposal; by this I mean firmness with absolute impersonality.

If the case is one of chronic paranoia with religious ideas and the patient imagines he has committed "the unpardonable sin" he needs to be handled gently and kindly; there are many passages of Scripture that may be used to rebut any argument he may advance—if the time comes when argument is advisable. As a matter of fact argument as such does little or no good; the rebuttal must be dogmatic and right from the shoulder.

If the case is one of hebephrenia in the confusional stage, then the treatment is not mental—the patient must be treated like a child; everything must be done for her, *e.g.*, her food brought to her and fed to her, her clothes arranged and her personal cleanliness looked after. Should she develop mania, steps must be taken to control her lest she expends too much energy or does harm to herself or others. Forced feeding is necessary even if the nasal tube must needs be exhibited. If this is the case the patient must be held very firmly and the operation expedited as much as possible, the idea being that the patient will get the impression that the act will surely be accomplished; it should be done in a decided but impersonal manner so as not to arouse the animosity of the patient.

The case that will require the most handling is the one that shows little confusion, no mania and only a few well-defined delusions of, let us say, a persecutory character. This person cannot be handled like a child; he must be sure that what is done is not done with some "hidden

purpose" in order to get the better of him. His confidence and respect must be obtained. The pressure of an intimate friend may be brought to bear on him at times in order to get him to do the thing that is planned for him. Force is to be cut out and tact made prominent. His companion must be congenial, resourceful and of an equable temper.

Having examined the patient and obtained the right companion, the next step will be to take him away from his home and place him in the environment that is suitable for carrying out the plan of action that has been resolved upon.

All of the six patients of this series were placed in the home of a physician who lived where city and country met. My belief is that this possesses many advantages over an institutional life, for these kinds of patients. It has the advantages of the personal supervision that an institution has and lacks the disadvantages that are so obvious in the treatment of these patients at the time when they begin to improve and it is so desirable to lift them out of their old ruts. Any academic discussion of this subject would be out of place in a clinical paper.

It does not seem to be doubted that all these patients do better where they can have the quiet of the country with its opportunities of outdoor exercises and freedom from the annoyances of the crowd or other forms of irritation. As for travel, the changes and excitements associated with it make it available in only a fraction of these cases; the time for it being during late convalescence and when a change or a series of changes may become an advantage.

During the course of treatment the patient should be commended—even *ad nauseam*—when the attempt is made to follow out the routine laid down; they are all very susceptible to flattery and on the other hand are much affected by blame.

The alimentary tract of these patients must be strictly attended to; many of them are of a bilious habit; their skin condition is generally bad; most of them are under weight and need to be thoroughly fed. They all need a lot of exercise—any kind rather than none. Indeed, these people should regularly go into training

for their fight with disease—the kind of training that aspiring pugilists impose upon themselves. The day is divided into sections during which a carefully arranged routine is carried out with promptness and strict observance. Among the forms of exercise may figure brisk walking, running, medicine ball, boxing, quoits, and the various forms of amusements for variety.

As the patient grows better and between relapses, if these are present, the mental treatment must be pushed; abnormal ideas are taken up one at a time and its fallacy demonstrated. Little by little and by means of repetition the normal will take the place of the abnormal and in time become a habit. This, to me, is the kernel of the whole matter; repetition of the normal thought, word, and act until the normal habit is formed again. The time to get in the best work is during the patient's "good days" and between relapses. The way to accomplish the most seems to be this—first get the patient's confidence, then secure a mental ascendancy and then begin a systematic and vigorous pushing of normal ideas, as though they were specifics; push them to toleration and then hold as much as possible.

As for drugs they ought to be exhibited for constipation, diarrhea, the overexcitability of mania, insomnia, and when a general tonic is needed.

As for special drugs thyroid extract should be exhibited when the danger signals of dementia begin to appear. To emphasize this I will quote Clouston: "The use of a course of thyroid extract given in 4 gm. (60 gr.) doses a day, to produce a short five or six days' fever is a most powerful therapeutic measure in many cases. No case should be allowed to become incurable without a trial of this method."

As for restraint it should be applied in cases of intense motor excitement and when danger to the patient might result unless it be applied. At very rare intervals it becomes a therapeutic measure. When necessary it should be applied in the form of padded leather cuffs for feet and wrists; these are so constructed that they may be placed easily; a strap around the waist and legs is fastened to clips on the cuffs and

thus the patient has sufficient use of the limbs and yet not enough to harm himself. When restraint is applied it should be done without violence; violence and anger are the worst measures that could be invoked, they are never to be permitted.

Two attendants are often needed but as soon as possible there should be only one. At times the patient will be better for a change of companions.

Given suitable surroundings and companions the patient's life is made as orderly as a military camp. He is in training for his health and he ought to be constantly impressed with this idea. If an adolescent he has come upon a time in his life that even in the normal being is a critical period and in his particular case—how much more so!

Much more might be pertinently written about these cases and many references made to the intensely interesting articles that have been written on this subject. I have purposely confined myself to these few cases that were of clinical interest and to some lessons learned from their management.

Apropos of the period of adolescence and in conclusion I wish to quote Stanley Hall as follows:

"Young children grow despite great hardships but later adolescence is more dependent upon favoring conditions in the environment, disturbances of which more readily cause arrest and prevent maturity. . . .as we advance to the later stages of adolescence all the liabilities to reversion are greatly increased *as is the predisposition to sickness*. The young pubescent, achieving his growth in the realm of fundamental qualities, dimensions and functions, comes up to adult size at 18 relatively limp and inept, like an insect that has just accomplished its last molt and is therefore far more in need of protection, physical care, moral and intellectual guidance; and in general this last great wave of growth throws the child up onto the shores of manhood or womanhood relatively helpless as from a second birth, rejuvenated, as if every call in his body had striven to revive for the last time its failing reproductive potency."

## A STATISTICAL STUDY OF THE RELATION BETWEEN THE HEIGHT OF THE LONGITUDINAL ARCH AND THE FUNCTIONS OF THE FOOT.<sup>1</sup>

BY

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During the summer of 1904, while examining the feet of primitive peoples at the St. Louis World's Fair (L. P. E.), the great variety of impression records obtained from feet that were functionally normal led me to study statistically the question of relation between the height of the longitudinal arch and the usefulness of the foot.

The records forming the basis of these statistics were made by the method of weight-bearing on smoked paper. It is true that they do not really show the height of the longitudinal arch, as they are commonly believed to do, but show the breadth of the arch and how much of the sole comes in contact with the ground on weight-bearing. This, however, bears a relationship to the height of the arch, and I speak of height in connection with these records in this sense only. Comparison of smoked imprints with plaster casts of the same feet, taken while bearing the body-weight, showed in each instance that the carbon impression corresponded to the flattened area of the sole of the cast, showing that the weight-bearing area could thus be accurately determined. The casts also showed that there was an almost constant relation between the extent of this area and the arch height, that is, the farther the imprint extended inward, the lower was the arch.

To simplify the comparison of records, I chose six types of arches, ranging from the well marked to the totally absent, and grouped the intermediate grades with the types they most nearly resembled. Fig. 1, A, high arch; B and C, moderate; D, somewhat; E, very low; F, absent.

<sup>1</sup> Read before the St. Louis Medical Science Club.

Impressions were taken of 186 individuals that had never worn footwear, seven of whom were Central African Negroes, and the balance Filipinos. It is significant that among these I did not find a single foot associated with the symptoms of weakness so common in adult shoe-wearing feet, which are weakened by the restraint the shoe exerts over function. Through interpreters I made careful inquiry in regard to this, especially whenever I found an arch that was exceptionally low. All had strong and flexible feet. Lowness of the arch, where



FIG. 1.—A few of the types of arches found in normal feet.

such was shown by the impression, was real and not merely simulated by an underlying pad of fat.

The following tables, 1 to 8, illustrate the frequency with which the different types occurred in the barefooted groups.

TABLE 1.

Frequency with which the different types of arches, shown in Fig. 1, occurred in 46 Moros, Philippine Islands. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
A .....	4 .....	8 16/23
B .....	6 .....	13 1/23
C .....	7 .....	15 5/23
D .....	7 .....	15 5/23
E .....	9 .....	19 13/23
F .....	13 .....	28 6/23
	<u>46</u>	<u>100</u>

TABLE 2.

Frequency of different types in 27 Bagobos, Philippine Islands. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
A .....	2 .....	7 11/27
B .....	6 .....	22 6/27
C .....	5 .....	18 14/27
D .....	4 .....	14 22/27
E .....	5 .....	18 14/27
F .....	5 .....	18 14/27
	<u>27</u>	<u>100</u>

TABLE 3.

Frequency of different types in three Mangyans, Philippine Islands. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
C .....	1 .....	33 1/3
E .....	2 .....	66 2/3
	<u>3</u>	<u>100</u>

TABLE 4.

Frequency of different types in 70 Igorrotes, Philippine Islands. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
A .....	6 .....	8 4/7
B .....	2 .....	2 6/7
C .....	8 .....	11 3/7
D .....	24 .....	34 2/7
E .....	18 .....	25 5/7
F .....	12 .....	17 1/7
	<u>70</u>	<u>100</u>

TABLE 5.

Frequency of different types in 33 Negritos, Philippine Islands. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
A .....	3 .....	9 3/33
B .....	4 .....	12 4/33
C .....	5 .....	15 5/33
D .....	6 .....	18 6/33
E .....	6 .....	18 6/33
F .....	9 .....	27 9/33
	<u>33</u>	<u>100</u>

TABLE 6.

Frequency of different types in all Philippine tribes. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
A .....	15 .....	8 4/9
B .....	18 .....	10
C .....	26 .....	14 5/9
D .....	41 .....	22 8/9
E .....	40 .....	22 3/9
F .....	39 .....	21 7/9
	<u>179</u>	<u>100</u>

TABLE 7.

Frequency of different types in seven Central African Negroes. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
A .....	2 .....	28 4/7
B .....	1 .....	14 2/7
D .....	2 .....	28 4/7
E .....	1 .....	14 2/7
F .....	1 .....	14 2/7
	<u>7</u>	<u>100</u>

TABLE 8.

Frequency of different types in all barefooted subjects examined. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
A .....	17 .....	9 4/31
B .....	19 .....	10 1/31
C .....	26 .....	14
D .....	43 .....	23 4/31
E .....	41 .....	22
F .....	40 .....	21 16/31
	<u>186</u>	<u>100</u>

In addition to the 186 barefooted individuals, I examined 45 South African Negroes, all adult males with functionally good feet, who had gone barefooted up to early manhood and had worn shoes during the last five or six years only. Table 9 shows the frequency of the different types of arches in this group.

TABLE 9.

Frequency of different types in 45 South African Negroes. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
A .....	6 .....	13 3/9
B .....	7 .....	15 5/9
C .....	8 .....	17 7/9
D .....	7 .....	15 5/9
E .....	11 .....	24 4/9
F .....	6 .....	13 3/9
	<u>45</u>	<u>100</u>

That as great variation in the height and shape of the longitudinal arch exists in Caucasian shoe-wearers as in barefooted peoples,



FIG. 2.—Impression records of the normal feet of a Bagobo woman, Philippine Islands. Note difference between right and left.

is shown in Table 10, which is based upon the examination of 200 pairs of normal, or at least symptomless feet.

TABLE 10.

Frequency of different types in 200 Caucasian shoe-wearers. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
A .....	27 .....	13 1/2
B .....	20 .....	10
C .....	27 .....	13 1/2
D .....	53 .....	26 1/2
E .....	40 .....	20
F .....	33 .....	16 1/2
	<u>200</u>	<u>100</u>

That the same is true of the American shoe-wearing negro is shown in Table 11, which is

based upon the examination of 100 pairs of symptomless feet.

TABLE II.

Frequency of different types in 100 American shoe-wearing negroes. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
A .....	18 .....	18
B .....	13 .....	13
C .....	19 .....	19
D .....	21 .....	21
E .....	16 .....	16
F .....	13 .....	13
	<u>100</u>	<u>100</u>

Table 12 shows the variation in five sandal-wearing Ainus.

TABLE 12.

Frequency of different types in five Ainus Caucasian sandal-wearers, Northern Japan. Feet symptomless.

TYPE OF ARCH.	NUMBER OF INDIVIDUALS.	PERCENT.
B .....	1 .....	20
C .....	1 .....	20
D .....	1 .....	20
E .....	2 .....	40
	<u>5</u>	<u>100</u>

It is probably true that weakness of the structures composing and maintaining the longitudinal arch is, in some instances, accompanied by a lowering of the arch, and that, on account of this lowering, the area of the sole of the foot coming in contact with the ground is increased. However, it was demonstrated by examination of imprints (collected between 1892 and 1904) of 560 feet that presented more or less typical symptoms of strain or weakness of the longitudinal arch, that gross change in the height of the arch is not as frequent an accompaniment of weakness as is commonly taught, in fact, that the average character of the imprints of feet with weakened arches does not differ much from the average character of those of symptomless feet. The result of this examination is shown in Table 13.

TABLE 13.

Frequency of different types in 560 Cau-

casian shoe-wearing feet that presented symptoms of weakness of the longitudinal arch.

TYPE OF ARCH.	NUMBER OF FEET.	PERCENT.
A .....	64 .....	11 3/7
B .....	72 .....	12 6/7
C .....	76 .....	13 4/7
D .....	92 .....	16 3/7
E .....	108 .....	19 2/7
F .....	148 .....	26 3/7
	<u>560</u>	<u>100</u>

Table 14 shows the comparative frequency with which the different types of arches occurred in Philippine Malays (barefooted); Central African Negroes (barefooted); South African Negroes (barefooted up to last six years); American Negroes (shoe-wearers); Caucasians (shoe-wearers); Ainus, Caucasians, Northern Japan (sandal-wearers); all presenting symptomless feet; and in Caucasians (shoe-wearers) under treatment for symptoms of weakness of the longitudinal arch.

Analysis of Table 14 shows that in the 536 individuals of different races, with symptomless feet, the American and primitive Negroes presented a smaller percentage of low and a larger percentage of high arches than did the Caucasians. This contradicts a commonly accepted view. The Philippine Malay showed a somewhat larger percentage of low arches than did either the Negro or Caucasian. Another thing shown in this table is that the 560 Caucasian feet with symptoms of weakened arches, did not present a much larger percentage of low arches than did the normal or symptomless Caucasian feet. The histories accompanying these 560 impression records show that the feet with long-standing or severe symptoms did not occur oftener among the lower arch-types than did those the symptoms of which were mild or of short duration.

While it is true that, usually, the impression records of the normal right and left foot of one individual are practically alike, there is, in occasional instances, a marked difference (Fig. 2). This occurs in both primitives and shoe-wearers. So, too, in individuals with one foot strong and symptomless and the other pre-

TABLE 14.

	Philippine Malays, bare- footed. Feet symptom- less. Indi- viduals ex- amined, 179.	Central African Ne- groes, bare- footed. Feet symptom- less. Indi- viduals ex- amined, 7. Number too small for re- liable con- clusions.	South Afri- can Negroes, bare-footed up to last six years. Feet symptom- less. Indi- viduals ex- amined, 45.	American negroes, shoe- wearers. Feet symptom- less. Indi- viduals ex- amined, 100.	Caucasians, shoe-wear- ers. Feet symptom- less. Indi- viduals ex- amined, 200.	Ainus, Caucasians, Northern Ja- pan, sandal- wearers. Feet symptom- less. Indi- viduals ex- amined, 5. Number too small for re- liable con- clusions.	Caucasians, shoe-wear- ers, under treatment for weakness of the longitu- dinal arch. Individuals examined, 560.
For types see Fig. 1.							
Type A	84 $\frac{1}{2}$ %	28 $\frac{1}{2}$ %	13 $\frac{1}{2}$ %	18 %	13 $\frac{1}{2}$ %	—	11 $\frac{1}{2}$ %
" B	10 %	14 $\frac{1}{2}$ %	15 %	13 %	10 %	20 %	12 %
" C	14 $\frac{1}{2}$ %	—	17 $\frac{1}{2}$ %	19 %	13 $\frac{1}{2}$ %	20 %	13 %
" D	22 $\frac{1}{2}$ %	28 $\frac{1}{2}$ %	15 %	21 %	20 $\frac{1}{2}$ %	20 %	16 %
" E	22 $\frac{1}{2}$ %	14 $\frac{1}{2}$ %	24 $\frac{1}{2}$ %	16 %	20 %	40 %	19 %
" F	21 $\frac{1}{2}$ %	14 $\frac{1}{2}$ %	13 %	13 %	16 $\frac{1}{2}$ %	—	26 %
Total	100 %	100 %	100 %	100 %	100 %	100 %	100 %

senting symptoms of arch-strain or weakness, the impression records of the two feet, while usually the same, show, occasionally, one arch to be lower than the other, *and the lower record is just as frequently made by the strong as by the weakened foot.*

If these statistics are a fair index for all feet, one may be justified in drawing the following conclusions:

1. That there is no one type of arch as the normal.

2. That, contrary to common opinion and teaching, the height and shape of the longitudinal arch are of no value in estimating the strength or usefulness of the foot.

3. That normal feet present high, medium and low arches in nearly the same proportions as do feet with weakened arches.

4. That weakness of the longitudinal arch rarely results in its depression, and that *flat-foot* as a *pathologic* entity is not common. (Compare Tables 10 and 13.)

5. That the impression records of the longitudinal arch, commonly made by surgeons, are of no value in the diagnosis of arch-strain or weakness, *so-called* flat-foot, the symptoms of which are dependent upon a weakened arch and not upon its lowness, except insofar as this lowness is a transition from an original higher condition with concomitant change in the relationship of the tarsal bones, which transition occurs far less often than is generally believed.

## BILATERAL ABDUCTOR LARYNGEAL PARALYSIS WITH TABETIC MANIFESTATIONS.<sup>1</sup>

BY

JAMES A. PATTERSON, M. D.,

and

L. GORDON BROWN, M. D.,

of Colorado Springs, Colorado.

The possibility from carelessness or ignorance of confusing incipient pulmonary tuberculosis with a laryngeal disease as was done in the following case before the patient was seen by Dr. Swan makes the appended history of sufficient interest to warrant its report.

A. L., male, aged 34, married eight years ago and a hotel-keeper by occupation, came to Colorado in October for the cure of a cough. On November 26, he consulted Dr. W. H. Swan with a history that his father's sister had died of tuberculosis, that he had lost flesh, and had a spasmodic cough at irregular times. He says that he has been unable to get life insurance on account of a persistent rapid pulse, which has existed for some years. There is a further history of a peculiar indigestion last summer which was accompanied by vomiting.

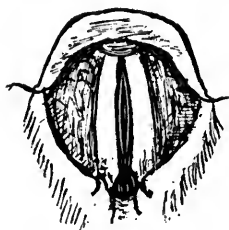
The patient walks with crutches, as he has had a high amputation of the right thigh, due to a tumor and bone disease, following the kick of a cow when he was aged 12.

Dr. Swan was unable to find anything pathologic in the patient's lungs or heart, and he was referred to me to see if there were any pharyngeal or laryngeal reasons for the cough. Dr. Swan noted that the patella reflex was

<sup>1</sup> Read before the El Paso County Medical Society at Colorado Springs, Feb. 13, 1907.

absent, and that the pupils reacted poorly to daylight.

I found, excepting some nonocclusive ridges on the septum nasi, nothing distinctly pathologic in the nose or throat. On vocalization the cords approximate normally. On inspiration he was unable to open the chink of the glottis normally, even on forced respiratory efforts the space between the cords was only about 2.5 mm. wide, showing a typical picture of bilateral paresis of abduction. Further examination disclosed absence of the patella reflexes (distinct Romberg), that his only leg sometimes gives way suddenly and at times feels numb and



Larynx on forced inspiration.

queer, worse if he attempts to walk in the dark. At long intervals only, particularly in the evening before retiring he has shocks in his leg like faradic electric currents. Cross questioning brought out an admission of chancre seven years ago followed in a few weeks by sore throat and alopecia. His wife has had no miscarriages.

*Eyes.*—O. D.  $v = 5-4$  ? reads 0.50 Snellen with each eye. Accommodation 5.5 d. O. S.  $v = 5/5$  ? No hyperphoria. Exophoria for distance of  $3^\circ$ . Ophthalmometer records O. D. 50:105 = O. S. 50:90. In the dark room pupils were equal, 6 mm. in diameter, immobile to light stimulus but react on convergence. There can, however, be obtained contraction of pupils on strong daylight stimulus. Possibly the right optic nerve is paler than the left; at both macula there is pigment disturbance. The fields are irregularly contracted.

The foregoing case is presented because of its unusual features; for the eye-ground picture; and to record a case in which a persistent rapidity of the pulse has apparently preceded all other symptoms of tabes. Persistent increased pulse frequently associated accompanied by paresis of the abductors of the larynx is emphasized by P. Watson Williams<sup>1</sup> as a suspicion always to be considered in the diagnosis of tabes.

<sup>1</sup> Diseases of the Upper Respiratory Tract.

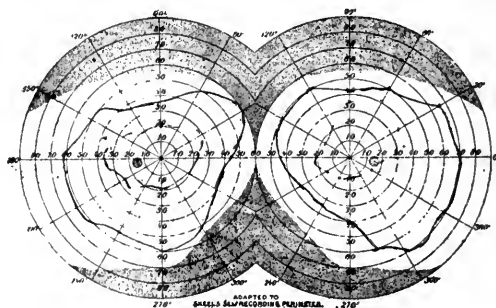
A report of the subsequent behavior of the case by Dr. Brown who took charge of the patient during Dr. Swan's illness is as follows:

#### DR. BROWN'S REPORT.

Mr. L. was suffering from severe nausea and vomiting when I saw him at 1 a. m. on December 24. During his illness I got the following notes which, not being taken with a view to reporting the case, are not as complete as I would like.

Aged 35, occupation hotel-keeper, married, two children aged four and six; the former whom I saw seemed bright and healthy and I observed no signs of hereditary syphilis. The older child, I was told, is in excellent health. The parent admits syphilis of eight years' standing and gives a confirmatory history. He was treated for one year with a brown liquid medicine, for four years he has had difficulty in controlling his urine alternating with periods of retention, bowels are not easily controlled, though sometimes constipated. He has had three or four attacks in the past two years, the last about four months ago, of vomiting, "weak spells" and convulsions; these have lasted from three to ten days. No history of alcoholism.

*Points of Special Interest Brought out by the Examination.*—Gait and station: As the patient had but one leg, the observations were not



reliable. Heel-jerk and ankle-clonus absent; knee-jerk absent with and without reinforcement. Plantar reflex—light or moderate stroke—no response; marked stroke caused dorsal flexion of foot which was delayed about five or six seconds (not timed). Lower abdominal reflex, quick response on two occasions. Pain and touch sense over his only leg always markedly delayed; over face, neck and chest, response was normal or slightly delayed. Tongue appeared normal, protruded in median line and was carried to right or left equally well. Speech clear and intelligent except following attacks. Pupils equal and about normal in

size and responded readily to accommodation on several occasions, 12/25; response to light about normal in time but very slight in extent; this condition obtained as regards right eye upon each examination; the left pupil on two occasions, December 28 and January 2, responded freely and quickly to light—about a normal response. Six hours before my visit at 1 a. m. and one hour after a very light supper of eggs, toast and tea, the patient became nauseated. The nausea was soon followed by severe retching and vomiting which persisted until 3:15 a. m. When about 10 minutes after a dose by mouth of cocain hydrochlorate 0.03 gm. ( $\frac{1}{2}$  gr.) a tonic convulsion began with rigid retraction of head, flexion of arms, respiratory stasis and cyanosis; sonorous respiration; rather general clonic muscular contortions, a short period of stupor followed by entire relief from nausea for a period of eight hours. In the half hour following the first convulsion, two others of similar character followed. The nausea began about noon again and was followed shortly by other epileptoid convulsions. During three days the nausea persisted at intervals, sometimes being associated with convulsive attacks, and at others bearing apparently no relation to the seizures. From six to ten of these attacks or convulsions occurred during each of the six days, when they entirely disappeared. The patient began eating and was up on the eighth day.

The points of special interest in the case are those brought out by Dr. Patterson and the convulsive seizures, the latter as an accompaniment of tabes being so rare as to merit no notice by Osler, Tyson, Collins, and Lawers and only passing notice in a footnote by Oppenheim in which he says they are not a symptom of this disease but result probably from syphilitic lesions in the cerebrum.

## TROPHONEUROSIS OF THE HANDS ALLIED TO ERYTHROMELALGIA AND TO RAYNAUD'S DISEASE.<sup>1</sup>

BY

ALFRED GORDON, M. D.,  
of Philadelphia.

Associate in Nervous and Mental Diseases, Jefferson Medical College; Examiner of the Insane at the Philadelphia Hospital.

The subject of localized disturbed nutrition depending upon the nervous system is still

obscure. The existence of trophic nerves still remains unproved, but we are in possession of many clinical facts which show the dependency of trophic changes upon vasomotor disorders. In Raynaud's disease and in erythromelalgia, the disturbance of the vascular supply is the main cause of morbid manifestations. These two affections, while apparently different from each other, cannot, for this reason, be sharply separated. Vasomotor disturbances of a limb or of two symmetric limbs may produce these affections in their typical forms or else present only some symptoms of them.

There are intermediary forms which may resemble one or the other and still not be absolutely identical to any of these diseases. The question of vasomotor neuroses or tropho-neuroses is, therefore, a vast one and it is not possible to classify all the cases in one or the other of the types of affections named. The case which I present is in my judgment a good illustration of this view.

Wm. S., grocery clerk, aged 23, noticed about nine weeks ago a redness of the left hand. Three days later the right hand became affected. Soon itching and burning developed. On some of the fingers the skin would break without any special cause; an ulceration would appear, which would not heal promptly. The fingers became stiff so that the patient was unable to bend them and this interfered with his work.

At present the hands are large, the skin of the fingers is thick and presents in some places ulcerations which, according to the patient, are extremely slow in healing. The hands are always red and the crimson color is more pronounced when exposed to cold. Cold produces pain, warmth gives a tingling sensation. When they hang down, the skin becomes scarlet. Exercise has no influence over them.

Upon touch they are warm. Sensations are preserved with the exception of the pain-sense which is somewhat diminished. The blanching which appears upon pressure on the skin, is slow to disappear. There is no pain. The only inconvenience the patient experiences is the stiffness of the fingers.

The patient's general health is good, the viscera are normal and he presents no symptom indicative of an organic nervous disease.

In discussing the diagnosis of the case, the

<sup>1</sup> Presented and patient exhibited before the Philadelphia County Medical Society, March 27, 1907.

first thought that suggests itself is erythromelalgia. In Mitchell's disease the characteristic features consist not only of redness, but also of intense burning pain which is increased by warmth and relieved by application of cold; the parts involved perspire profusely; also when the patient is at rest, the affected limbs are cold and even pale; finally the pain is generally worse at night and is much increased by exercise of any kind.

In the present case the only resemblance to erythromelalgia is the redness of the skin. Application of cold, on the contrary, produces pain; the temperature of the hands is uniformly and invariably elevated; the parts are never pale and never perspire. Finally exercise has no effect upon the subjective sensations of the hands. With Raynaud's disease the present case has some points in common. In the stage of cyanosis the fingers are swollen, of vivid red color and hot; when pressed upon, the local anemia produced is slow to disappear. The destruction of the epidermis and ulcerations have no tendency to heal up. The blisters in this case appeared without any traumatic cause; the healing process is extremely slow, some ulcerations have existed since the onset of the malady.

There can be no doubt that the condition of my patient is due to a vasomotor disturbance of the circulation of the hands. Whether it is due to a paresis of the vasoconstrictors or to an irritation of the vasodilators, it is difficult to say. Whether the peripheral sympathetic system or its origin in the cerebrospinal axis is at fault, it is also difficult to say. Cases, in which the condition developed after exposure to cold, militate in favor of an involvement of the local vasomotor system. Cases like Collier's<sup>1</sup> speak in favor of an involvement of the sympathetic ganglion. As for erythromelalgia, Mitchell admits a vasomotor neurosis, but this is probably a peripheral neuritis. In my case the absence of pain or of paresthetic disturbances when the hands are at rest, excludes the possibility of neuritis or neuralgia. As the redness is continuous, the vasomotor symptom

is very probably due to a diseased condition of the sympathetic system.

The interest of the case lies in its apparent resemblance to erythromelalgia but without many characteristic features of the latter. It also presents some of the features of Raynaud's disease. It is allied to these two affections, the *raison d'être* of which lies in the disturbance of the vascular supply. The pathogenesis of similar cases presents more obscurity than in Mitchell's and Raynaud's diseases.

### LEGAL CONTROL NECESSARY IN THE TREATMENT OF DRUG HABITS.<sup>1</sup>

BY

FREDERIC HENRY GERRISH, M.D., LL.D.,  
of Portland, Me.

Physicians who have been in general practice for a number of years appreciate, as persons outside of the medical profession cannot, the great prevalence of drug habits. Addiction to alcohol is most frequently observed; but opium and its principal alkaloid claim hordes of victims, and the newer drugs which relieve pain or produce exhilaration are hardly introduced into our medicinal armamentarium before we find that they have begun the enslavement of some to whom their first service was an apparent blessing. We have all seen lamentable examples of the mastery which cannabis, cocaine, chloral, antipyrin, and other valuable agents, like demoniac incubi, have obtained over seemingly strong men, whom they have changed from vigorous, upright, useful citizens to feeble, knavish, dangerous wretches. Body and mind are wrecked, and the moral sense obtunded or destroyed.

The victims come to us in humiliation and penitence, and profess themselves willing to submit to any conditions that we see fit to impose in order to effect a cure—and they are honest in this declaration. But the complete or partial withdrawal of the enslaving drug is an essential feature of any method of treatment. If we trust to the will-power of the patient, we soon discover that our confidence

<sup>1</sup>Read before the American Therapeutic Society, May 4, 1907.

<sup>1</sup>Manchester Medical Chronicle, 1889.

has been misplaced and our endeavors frustrated. He may comply with our regulations for a few hours, perhaps even for a few days; but the old craving soon returns, and, unless he is forcibly restrained, he flings his solemn pledges to the winds, and with consummate craft procures the desired intoxicant, conceals the fact with amazing ingenuity, and lies about it with every appearance of innocence and good faith. Physical restraint must be employed in almost any case in order to obtain the perfect control that is essential to a cure. If, however, we interfere with the patient's freedom of action, even though we do so in accordance with his previous agreement, voluntarily expressed by him when he was sanest, we lay ourselves liable to a suit for false imprisonment, which may rob us of the savings of years. We cannot afford to accept such cases, because we either waste our efforts, or incur an unjustifiable risk.

The only method by which the conflicting interests of the physician and his patient can be reconciled is legal—the enactment of a law by the provisions of which a person who has a drug habit can relinquish his freedom for a period of time that is long enough for a cure to be effected, or, at least, to start him fairly on the normal road. Thus the patient has his only chance for recovery, and the physician his only protection from insane and monstrous persecution.

The statute-law pays little heed to this class of cases. In many States the law makes it somewhat difficult for the victims of certain drug-habits to obtain their favorite intoxicants; but there are many ways of nullifying the intent of the statutes. In a few States there are "inebriety laws" and "vagrancy laws," which are helpful in some degree; and in one State a victim of a drug habit may be committed to an insane hospital. But one cannot severely censure a person for shrinking from becoming an inmate of an asylum for drunkards, or publicly confessing himself a vagrant, or admitting that he is a lunatic. These patients are often entitled to our sincere sympathy; and, in any event, we should endeavor to avoid a line of treatment that will compromise self-respect, supposing that the miserable creature has even a particle of this admirable quality left.

So far as I know, Maine is the only State that provides by law for the voluntary relinquishment of a drug victim's liberty for a stated period. In 1905 the Legislature added to its code the statute with which I close this paper. I do not know to what extent it has been appealed to for support; but I have heard of no complaint that it is unjust, too severe, or other than salutary. It seems to protect the interests of the patient and the safety of the physician; and it may well serve as a suggestion, perhaps as a model, for legislation throughout the country.

An Act to provide for the treatment of persons suffering from the effects of the habitual use of Narcotics.

Section 1. A person alleged to be suffering from the effects of the use of an opiate, cocaine, chloral hydrate, or other narcotic may be committed to the care of any general hospital receiving aid from the State, or any legally qualified physician of not less than five years' actual practice, for treatment; and the medical authorities of said hospital or said physician to whom said patient is committed shall have the power and authority to restrain said patient, so committed, in such manner as may be necessary for his protection for a period not exceeding 90 days.

Section 2. Before any restraint shall be imposed under the authority of this act, a voluntary agreement shall be made in writing by the person suffering from the effects of any drug mentioned in section one of this act, to the imposition of restraint upon his actions, if necessary, and such agreement must be witnessed by the husband, wife or parent of the person aforesaid, or one of the municipal officers of the city or town in which the person, suffering as described in this act, is a resident, and approved after reasonable notice, by a justice of the supreme judicial court or a judge of the superior court or probate court in the county where the patient resides.

Section 3. Any justice of the supreme judicial court, or a judge of the superior court or probate court in the county where the patient resides, may, at his discretion, require the president or secretary of the State Board of Health, or one of the county examiners of insane criminals, to investigate as to the progress of any such case; and upon his certificate that further restraint is unnecessary, may annul the agreement, and the person restrained shall be immediately released upon the order of said justice.

## CLINICAL NOTES.

A SUGGESTION AS TO THE PROPER TIME TO  
USE THE ULTRAVIOLET AND RÖNTGEN  
RAYS IN THE TREATMENT OF  
TUBERCULOSIS.

BY

C. F. GISSLER, M. D.,  
of Brooklyn, N. Y.

Most if not all of the very low organisms, such as those that can only be killed by prolonged boiling or by strong chemicals, possess what might be called an eternal life. The discovery of this fact formed the basis of modern asepsis, the surgical era. A few years ago Professor Aug. Weismann, of the Freiburg University, in his book "Die Dauer des Lebens" showed us that death does not at all exist in many low organisms, such as infusoria, one-celled algæ, amebas, etc. They have an everlasting existence, provided that their necessary external conditions for life are found in their surroundings. A discovery of a way to kill or change the activity of certain low organisms was made a few years ago by the application of light, *i.e.*, ultraviolet and röntgen rays. I am therefore of the opinion that when a cure of pulmonary tuberculosis is effected by light and by sleeping in the open air as practised in the sanatoriums in the Adirondacks, such cure is due largely to highly ozonized air inhaled at either dawn, morning, or evening. At these times the virulently acting tubercle bacilli might congregate at different, more peripheral districts of the pulmonic tissue, than at any other time during the day. Now taking this for what it is worth, could not the ultraviolet and the röntgen rays be applied at the same hours more efficaciously than hitherto? Those hours would not be very convenient for the lung specialist or in general hospital practice or routine, but it would seem to be worth trying. Judging from analogies in the rhythm we observe in organic nature, the birth of our house animals and of our children, so also the greater activity of many low forms of life and perhaps of our deadly enemy, the bacillus, occurs at either dawn or dusk.

## SPECIAL ARTICLES.

SOCIETY FOR EXPERIMENTAL BIOLOGY AND  
MEDICINE.

## Twenty-first and Twenty-second Meetings.

Proceedings Reported by the Secretary,

WILLIAM J. GIES, PH.D.,  
of New York.

## Twenty-first Meeting.

College of Physicians and Surgeons, Columbia University, March 20, 1907. President Flexner in the chair.

*Members Present.*—Adler, Beebe, Burton-Opitz, Carrel, Crampton, Crile, Emerson, Ewing, Field, Flexner, Gibson, Gies, Hatcher, Lee, Levene, Levin, Lusk, Mandel (J. A.), Meltzer, Murlin, Noguchi, Opie, Richards, Schwyzer, Shaffer, Torrey, Tyzzer, Wadsworth, Wallace, Wolf.

ABSTRACTS OF THE COMMUNICATIONS.<sup>1</sup>

*A Study of the Vital Conditions Determining the Distribution and Evolution of Snails in Tahiti, with Illustrations.*—H. E. CRAMPTON.

It was shown that different valleys of Tahiti contain forms of the genus *Partula* that, on account of their more or less complete isolation, have come to differ in correlation with their geographical proximity or remoteness. Evidence was adduced showing that "mutations" have arisen at various recent times.

*The Parathyroid Gland, with Demonstrations of the Effects of Hypodermic Injections of Parathyroid Nucleoproteid after Parathyroidectomy.*—S. P. BEEBE.

It has been found that the symptoms of tetany following parathyroidectomy in dogs can be inhibited by the hypodermic injection of parathyroid nucleoproteid. The globulin from these glands has not been found effective. If the nucleoproteid is heated to boiling in an alkaline medium its inhibitive powers are destroyed.

*Further Experimental and Clinical Observations on the Transfusion of Blood.*—GEORGE W. CRILE.

Beneficial results were obtained after acute

<sup>1</sup>The abstracts presented in this account of the proceedings have been greatly condensed from abstracts prepared by the authors themselves. The latter abstracts of the communications may be found in Number 4 of Volume IV of the Society's proceedings, which may be obtained from the secretary.

hemorrhage, after pathologic hemorrhage, and in the treatment of shock and illuminating gas poisoning. Negative results were obtained in pernicious anemia, leukemia, carcinoma, strychnin poisoning and diphtheria toxemia.

*A Preliminary Report on the Direct Transfusion of Blood in Animals Given Excessive Doses of Diphtheria Toxins.*—GEORGE W. CRILE and D. H. DOLLEY.

Transfusion had no beneficial effects on dogs that received lethal doses of the toxin. Exsanguinated normal dogs, that received blood from dogs treated with excessive doses of toxin, were apparently unaffected. Blood-letting, as well as blood-letting followed by transfusion of physiological salt solution, had no effect upon the action of the toxin.

*The Effect on the Normal Dog Heart of Expressed Tissue Juice from Hearts of Dogs Poisoned with Diphtheria Toxin.*—J. J. R. MACLEOD and GEORGE W. CRILE.

Expressed juice from hearts of dogs poisoned with diphtheria toxin, caused cardiac paralysis and fibrillation when perfused through hearts of normal dogs. The same result was obtained, however, with similar juice from normal hearts and with aqueous solutions of the ash obtained from such juice. The paralytic result was attributed to the influence of potassium, although the associated fibrillation requires a different explanation.

*Experimental Liver Necrosis.*—I. Hexon Bases.—HOLMES C. JACKSON and RICHARD M. PEARCE.

In the scattered focal necroses of the livers of dogs and horses the nitrogen precipitable by phosphotungstic acid, after acid hydrolysis, formed 11.3 percent and in the diffused necroses 30 percent of the total nitrogen, as against 15 percent for the normal.

The necrotic livers that were allowed to undergo autolysis showed approximately the same percentage loss of phosphotungstic-precipitable nitrogen (hexon) as normal livers, despite the extent of the necrosis. In the focal necrosis the average was 28 percent, in the diffuse necrosis, 21 percent.

*The Action of Nitric Acid on the Phosphorus of Nucleoproteids and Paranucleoproteids.*—A. B. MACALLUM.

Phosphorus is combined in caseinogen in a manner very different from that which obtains in true nucleoproteids. When treated with nitric acid (1.2 sp. gr.) at 35° C for two weeks, no phosphate is produced. Nucleic acid and true nucleoproteins yield phosphate under such conditions. Nitric acid may therefore be em-

ployed to distinguish nucleic acid and the typical nucleoproteids from paranucleic compounds.

*Does the Stomach of the Dog Contain Free Hydrochloric Acid During Gastric Digestion?*—LAFAYETTE B. MENDEL.

Many positive results were obtained.

*On the Nature of the Process of Fertilization.*—JACQUES LOEB.

The author's recent experiments have shown that in the purely osmotic process of producing artificial parthenogenesis, we are in reality dealing with a combination of two different agencies, one being the increase of the osmotic pressure at a comparatively low concentration of hydroxyl ions, and the other, the hydroxyl ions at a comparatively high concentration. The proof for this statement rests upon the following experimental facts.

(a) When the concentration of the OH is below a certain limit, namely,  $10^{-6}n$ , even the maximal increase of osmotic pressure fails to cause the formation of larvae from the unfertilized eggs.

(b) When the concentration of hydroxyl ions is high, e.g.,  $10^{-3}n$ , a very slight increase of the osmotic pressure is able to call forth the formation of larvae.

(c) The effects of the two agencies can be separated by first putting the eggs for from one and one-half to two hours into a hypertonic solution with a concentration of hydroxyl ions between  $10^{-7}$  and  $10^{-6}n$ , and afterward transferring them for some time to an isotonic solution with a concentration of hydroxyl ions of about 2 or  $4 \times 10^{-3}n$ . While no egg that has been exposed to the hypertonic solution will develop, many or possibly the majority of the eggs that have in addition been exposed to the hyperalkaline solution will develop into larvae, many of which are perfectly normal and rise to the surface. Eggs which develop into larvae very often (possibly always) have a membrane which, however, differs from the fatty acid membrane or the fertilization membrane in this, that it is not separated by so wide a space from the protoplasm and therefore easily escapes detection.

*Comparative Chemical Composition of the Hair of Different Races.*—THOMAS A. RUTHERFORD and PHILIP B. HAWK.

After subjecting hair obtained from Indian, negro, Japanese and Caucasian subjects, to the action of digestive juices, and also alcohol and ether, the percentage content of sulphur, nitrogen, carbon and hydrogen in the remaining keratin was found to be nearly the same for each type. The S:N ratio was practically 1:3 in each case.

*The Oxidation of Sugars by Cupric Acetate-Acetic Acid Mixtures.*—A. P. MATHEWS and HUGH MCGUIGAN.

The addition of acetic acid to cupric acetate diminishes its speed of oxidation. The amount of acid that may be necessary to check the oxidation to any given rate depends on the concentration of the acetate; the more concentrated the acetate the more acid is required.

Solutions of different concentrations of acetate and acetic acid were prepared which would just fail to oxidize levulose to a visible production of cuprous oxid after a half-minute's boiling. Similar solutions were prepared for the different sugars. Each of these solutions for any given sugar of one percent concentration had the same speed of oxidation. In all the solutions oxidizing any one sugar with the same speed, the decomposition tension of the cupric oxid in the solutions was a constant. For the different sugars the following data for decomposition tension were obtained in those

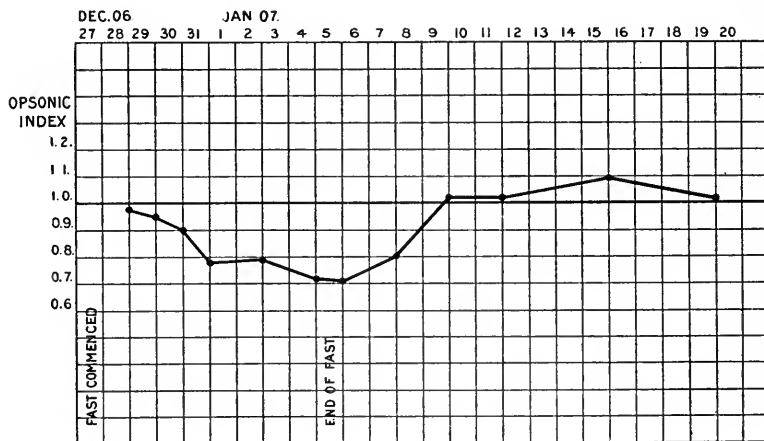
*The Automatism of the Respiratory Center.*—G. N. STEWART and F. H. PILE.

The authors described a method which seems to afford a means of temporarily eliminating all the afferent paths connected with the respiratory center. Since under these conditions the center continues to discharge itself in such a way as to maintain a long and unbroken series of regular, efficient respiratory movements, its normal activity is to be considered an example of physiological automatism, not originated, although influenced, by afferent nervous impulses.

*A Series of Spontaneous Tumors in Mice.*—E. E. TYZZER.

In the investigation of tumors in mice; attention has been directed, for the most part, to those which develop in the subcutaneous tissue. It is possible that internal tumors often occur unnoticed.

The author described tumors of the lungs, kidneys, mammary glands and lymphatic glands



solutions that just failed to show oxidation to a visible extent after a half-minute's boiling. Levulose, 0.583 volt, galactose, 0.562 volt, glucose, 0.558 volt, maltose, 0.532 volt, lactose, 0.519 volt.

A cupric acetate-acetic acid mixture of proper concentration will show the same selective action toward levulose that many bacteria and other living organisms manifest and will oxidize the levulose almost completely before the glucose is attacked.

*Observations on the Effects of Fasting upon the Opsonic Power of the Blood to Staphylococcus Aureus.*—ALLAN C. RANKIN and A. A. MARTIN (by invitation).

Fasting perceptibly diminished the particular opsonic power studied from 0.98 to 0.7.

and stated the effects of their inoculation into mice. Silver preparations were made by the method of Levaditti and the results given of an extended examination for spirochetes.

*Concerning the Neutrality of Protoplasm.*—LAWRENCE J. HENDERSON (by invitation).

It is desirable, both on account of the normal production of acid during metabolism, and because of the production of acid under pathological circumstances, to study the adjustment of equilibrium in protoplasm whereby neutrality is maintained.

As a result of this investigation it appears that in the presence of both free and combined carbonic acid in measurable amount, mixtures of sodium hydroxid, phosphoric acid and carbonic acid are precisely neutral to rosolic

acid, and that the amount of sodium bicarbonate in such mixtures can vary considerably without great variation in the ratio between monosodium phosphate and disodium phosphate. These results are in accord with the theory, based upon the ionization constant of carbonic acid ( $3 \times 10^{-7}$ ) and of the ion  $\text{H}_2\text{PO}_4(2 \times 10^{-7})$ . Although the equilibrium in such a system at  $40^\circ \text{C.}$  may be somewhat different, it is evident that this equilibrium will almost perfectly protect protoplasm from variation in neutrality. The variation in hydrogen and hydroxyl ionization can hardly be more than  $5 \times 10^{-7}$ .

*The Influence of Adrenalin upon the Venous Blood Flow.*—RUSSELL BURTON-OPITZ.

The blood flow in the femoral, external jugular and azygos veins was measured by means of the stromuhr previously described by the author. During the experiment, solutions of adrenalin were injected centrally to the stromuhr. The effect of the adrenalin showed itself in a retardation of the venous inflow, which appeared in from 14–16 seconds after the injection. Considering the velocity of the venous blood stream, it must be assumed that the adrenalin did not produce its characteristic affects until it had reached the arterial side of the circulatory system. The experiments tend to disprove the existence of vasomotor nerves in the central veins and the pulmonary circuit.

*The Viscosity of Laked Blood.*—RUSSELL BURTON-OPITZ.

It was found that the viscosity of laked blood, prepared by the process of freezing, is very much less than the viscosity of defibrinated blood. The specific gravity was only slightly lessened. Examples of the experimental data are appended:

Defibrinated Blood.		Laked Blood.	
Spec. Grav.	Viscosity.	Spec. Grav.	Viscosity.
1.0566	665.74	1.0563	982.35

*The Determination of Ammonia and Urea in Blood.*—W. MCKIM MARRIOTT and C. G. L. WOLF.

Ammonia is determined by distillation in vacuo; 100 cc. of blood are treated with 50 cc. of saturated sodium chlorid solution and 250 cc. of methyl alcohol are added to the mixture. The resultant precipitate is finely granular. The residue is filtered off in a filter press, and the filtrate distilled for 40 minutes, with the temperature of the water bath at  $40\text{--}50^\circ \text{C.}$  The receivers are charged with  $n/50$  sulfuric acid, and the acid titrated with  $n/50$  sodium hydroxid free from carbonate. Sodium alizarin sul-

fonate is used as the indicator. The results are perfectly accurate.

The residue after distillation is made acid with hydrochloric acid, evaporated and hydrolyzed with 10 gm. of glacial phosphoric acid at  $150^\circ \text{C.}$  The ammonia formed from the urea is then distilled into  $n/50$  acid. The duplicates have shown very satisfactory agreement, but it is quite certain that not all the urea which is added to a sample of blood is recovered. It is probable that the carbohydrates in the residue combine with the urea at the temperature of hydrolysis and prevent the formation of ammonia.

*The Resolution of Fibrinous Exudates, with Exhibition of Specimens.*—EUGENE L. OPIE.

During the early stage of inflammation, a fibrinous exudate, freed from the serum by washing in salt solution, undergoes digestion when suspended in an alkaline (0.2 percent sodium carbonate), or in an acid medium (0.2 percent acetic acid). At the end of six days, when fluid has disappeared from the pleural cavity, digestion fails to occur in an alkaline medium, but occurs with great activity in the presence of acid.

During the first stage of the inflammatory reaction, when fluid is abundant and the fibrin which is present digests in the presence of alkali, polynuclear leukocytes are very numerous in the meshes of the fibrin. In the second stage, when fluid has in great part disappeared, and the fibrin contains only one enzyme active in the presence of acid, polynuclear leukocytes have disappeared and only mononuclear cells are embedded in the fibrin.

Since the acids, which, *in vitro*, favor the action of the enzyme present in the second stage of the process, do not occur in the body, the possibility has suggested itself that carbon dioxid brings this enzyme into action. When carbon dioxid is passed through normal salt solution in which strips of such fibrin are suspended, digestion is very greatly hastened. The normal inhibition exerted by blood-serum upon the enzyme is overcome by carbon dioxid; in the presence of a small quantity of blood-serum, carbon dioxid causes greater enzymotic activity than in the presence of salt solution alone.

*Extirpation of Both Kidneys from a Cat and Transplantation of Both Kidneys from Another Cat, with Exhibition of Specimens.*—ALEXIS CARREL.

Both kidneys from a cat were extirpated and immediately replaced by both kidneys from another cat. After this operation the animal urinated abundantly. Urine collected during

the first few days contained albumin. On the fourteenth day the cat was operated on for hernia of the small intestine through the abdominal wound. The animal died from general peritonitis one day after this second operation.

The anatomical specimen shows that the kidneys are a little enlarged. There is a slight hydronephrosis on the left side. Nevertheless, both organs appear to be in good condition.

### Twenty-second Meeting.

Rockefeller Institute for Medical Research, April 17, 1907. President Flexner in the chair.

*Members Present.*—Auer, Beebe, Burton-Opitz, Calkins, Carrel, Emerson, Ewing, Field, Flexner, Gibson, Gies, Hatcher, Kast, Levene, Loeb (L.), Meltzer, Morgan, Noguchi, Richards, Salant, Shaffer, Teague, Torrey, Wadsworth, Wallace, Wolf, Wood.

*Members Elected.*—R. R. Bensley, William T. Councilman, Ludwig Kast, Waldemar Koch, W. J. MacNeal, F. P. Mall, T. Brailsford Robertson, Oscar Teague, Richard Weil.

#### ABSTRACTS OF THE COMMUNICATIONS.<sup>1</sup>

##### *Wounds of the Pregnant Uterus.*—LEO LOEB.

Experiments were carried out on 26 guinea-pigs at different stages of pregnancy. Wounds were made in various directions in the uterus, or part of the wall of the uterus was inverted so that the mucous membrane was turned outside. It was found that at a certain stage of pregnancy, namely from the fourth to the sixth day, nodules of decidual tissue were formed at places where the continuity of the uterus had been interrupted or where the mucous membrane had been inverted. Serial sections of these nodules showed that they consisted of typical decidual tissue, which did not include a developing ovum. Between the third and fourth weeks after impregnation, such nodules became necrotic.

These experiments were also of interest in seeming to show that under ordinary conditions it is not possible to produce an abdominal pregnancy in the guinea-pig by various injuries of the uterus.

##### *The Effect of Light on the Staining of Cells.*—LEO LOEB.

<sup>1</sup> The abstracts presented in this account of the proceedings have been greatly condensed from abstracts prepared by the authors themselves. The latter abstracts of the communications may be found in Number 5 of Volume IV of the Society's proceedings, which may be obtained from the secretary.

In solutions of dyes (neutral red, eosin, methylene-blue, methyl violet and others), cells (eggs of *Asterias*) are stained differently according to whether the cells and solutions are exposed to the light or kept in the dark.

The difference in the staining of cells in the light and dark is caused by at least two different effects of the light. (a) The light causes primary changes in the cells, and the difference in the staining of cells in the light and in the dark is caused by those primary changes which the light produces in the cells. This applies to staining with eosin, neutral red, and with certain mixtures of eosin and methylene-blue, and eosin and neutral red. (b) The light changes primarily the staining solutions and the staining of the cells corresponds to the primary changes in the staining solution. This applies to staining with pure methylene-blue and to such mixtures of methylene-blue and eosin as contain much methylene-blue. It also applies, perhaps, to solutions of hematoxylin. The staining of the cells in the light as well as in the dark depends also upon the proportions in which both dyes are present in the mixture.

It is possible to distinguish the two factors stated under *a* and *b* by killing the cells with heat. The effect of light upon the cells which is caused by its direct action upon them, disappears if the cells have been previously killed. The changes, on the contrary, which are secondary to the primary changes in the staining solutions still occur.

Means which diminish the oxidative processes in the cells (*e. g.*, addition of KCN), and also saturation of the solution with oxygen, do not modify markedly the differences in the staining of the cells in the light and in the dark.

##### *The Abolition of Visceral Pain by Intramuscular Injection of Cocain. A Demonstration.*—LUDWIG KAST and S. J. MELTZER.

It was shown that the intestines of a normal dog under slight ether anesthesia were not devoid of the sensation of pain and that cocain (intramuscular injection) abolished the pain through a remote anesthetic effect.

##### *The Effect of Nephrectomy upon the Toxicity of Magnesium Sulphate when Given by Mouth. A Demonstration.*—S. J. MELTZER.

It was shown that in nephrectomized rabbits magnesium sulphate produces a profound general effect even when given by mouth, and that the absence of such an effect after the usual administration of the compound is due to the comparatively prompt elimination through the kidneys of a large part of the absorbed salt, thus preventing at any given time the accumu-

lation within the organism of a quantity equal to a toxic dose.

*Observations of a Rabbit for 30 months after the Removal of the Superior Cervical Ganglion.*—S. J. MELTZER.

The left superior cervical ganglion of a full-grown, gray, male rabbit was removed October 14, 1904. The animal died April 23, 1907. During the last 18 months of its life *the blood-vessels of both ears were never very wide and showed but little of the usual rhythmical changes.*

After removal of the ganglion, a subcutaneous injection or an instillation of adrenalin into the conjunctival sacs of the rabbit caused dilation of the pupil on the side from which the ganglion was removed. *This biological test for the absence of the ganglion*, was frequently made within the two and a half years of the animal's life and it was found that *a subcutaneous or intramuscular injection or an instillation of adrenalin invariably caused a long lasting dilation of the left pupil.* In further harmony with this proof that the ganglion was not regenerated, or at least the postganglionic and preganglionic nerve fibers did not grow together, it was found that while stimulation of the right sympathetic easily caused the usual effects upon the ear vessels and the pupil of the corresponding side, *stimulation of the left cervical sympathetic caused no changes whatsoever in the left pupil or in the vessels of the left ear.*

During the last 12 months of the rabbit's life, the dilation of the left pupil never attained the same degree as during the earlier period. Further, an intramuscular injection of adrenalin, which in the early period caused dilation of the pupil within two or three minutes, lately developed its effect very slowly. Finally the constricting effect of eserine was only partly overcome by an injection or instillation of adrenalin, whereas in the early period the effect of eserine was completely overcome by adrenalin.

Within the last 10 months *the right pupil was permanently distinctly larger than normal and responded sluggishly to light. An injection of adrenalin caused a distinct constriction*, which lasted about 15 minutes. After the above mentioned stimulation of the cervical sympathetics, *the permanent dilation of the right pupil disappeared for about five weeks and an injection of adrenalin had no effect upon the pupil.*

At the autopsy, no sign of a ganglion could be discovered on the left side.

*Intra-abdominal Pressures.*—HAVEN EMERSON.

In dogs the pressure varied from 2–45 mm. of water above atmospheric, *i. e.*, positive.

In cats it was from 2–20 mm. positive; in rabbits from 2–25 mm. positive; in calves from 2–10 mm. positive.

The causes of this persistent but fluctuating positive pressure within the free peritoneal cavity are the tone of the muscular walls of the peritoneal cavity, including the diaphragm and the pelvic floor. The contraction of the diaphragm is the chief, if not the only factor in the normal rise in pressure during inspiration.

Debilitated states show a low pressure. Ether anesthesia causes a gradual drop in pressure until with complete loss of muscular tone, the pressure reaches zero. Curare likewise causes a progressive fall to zero pressure. Asphyxia develops great rises in pressure during inspiration until muscular relaxation allows a drop to zero just before death.

Excessive pressure artificially produced within the peritoneal cavity causes death from cardiac failure before the obstruction to respiratory excursion has developed a marked asphyxia. The pressure is the same at all points of the peritoneal cavity, and is subject to identical variations wherever the recording trocar is placed.

The physiological function of these pressure conditions seems to be chiefly in assisting the circulation of blood and lymph, thereby playing an important role in the processes of absorption and elimination which take place within the abdomen.

*On the Influence of CO<sub>2</sub> on the Viscosity of the Blood.*—RUSSELL BURTON-OPITZ.

The dogs used in these experiments received alternately a supply of normal air and air charged with CO<sub>2</sub>. During the period of inhalation of the air plus CO<sub>2</sub> the arterial blood showed a somewhat greater viscosity than during the time when the animal breathed normal air. The changes appeared very promptly, but were never very conspicuous. The specific gravity of the blood pursued a course parallel to that of the viscosity.

*Agglutinins and Precipitins in Anti-gonococcic Serum.*—JOHN C. TORREY.

Rabbits and other laboratory animals, when inoculated with cultures of gonococcus, raise specific agglutinins and precipitins.

Normal rabbit serums contain different amounts of agglutinin for gonococcus. Strains of gonococci differ greatly in the titer of their agglutination with various gonococcic immune serums. After one inoculation with a certain culture a large amount of agglutinin was produced for some strains, but none for others.

Absorption experiments indicate than an

antigonococcic serum may contain, in addition to the specific homologous agglutinins, several groups of agglutinins which act on the different cultures quite independently of one another. At least three groups were found whose major or specific agglutinins are not removed by inter-absorption. This indicates that as far as agglutination is concerned, there are specific differences between these groups. The family gonococcus is, accordingly, heterogeneous rather than homogenous, and in that respect resembles the dysentery, colon and streptococcus families. In making a serum for therapeutic purposes, this fact should be borne in mind.

The passage of a culture of gonococcus through a guineapig caused a very marked decrease in its agglutinability. With the exception of one serum, meningococcus agglutinated only in low dilutions of the antigenococcic serums.

Antigonococcic serum contains specific precipitins for gonococcus. There appeared to be no relation between the precipitating and the agglutinating properties of an antigenococcic serum for a culture of gonococcus.

Antigonococcic serums contain, as a rule, some precipitins for meningococcus, but none for *m. catarrhalis* or *staphylococcus*.

There is evidence of a relationship between gonococcus and meningococcus, but not of as close a one as has been described by some investigators.

*On the Separate Determination of Acetone and Diacetic Acid in Diabetic Urines.*—OTTO FOLIN.

Measure 20–25 cc. of acetone solution or urine into an aërometer cylinder and add 0.2–0.3 gm. of oxalic acid or a few drops of 10 percent phosphoric acid, 8–10 gm. of sodium chlorid and a little petroleum. Connect with the absorbing bottle (as in the ammonia determination), in which has been placed water and 40 percent KOH solution (about 10 cc. of the latter to 150 cc. of the former) and an excess of a standardized solution of iodine. Connect the whole with a Chapman pump and run the air current through for 20–25 minutes. (The air current should be fairly strong but not as strong as for the ammonia determination.) Every trace of the acetone will now have been converted into iodoform in the receiving bottle. Acidify the contents of the latter by the addition of concentrated hydrochloric acid (10 cc. for each 10 cc. of the strong alkali used) and titrate the excess of the iodine, as in the Messinger-Huppert method, with standardized thio-sulfate solution and starch.

The estimation of the acetone can be made

simultaneously with the determination of the ammonia, by the use of the same air current and even in the same sample of urine, but the author does not recommend such simultaneous determination except for cases where the amount of available urine is small.

*On Magnesium and Contractile Tissues.*—PERCY G. STILES.

The author extended and confirmed the findings of Meltzer and Auer. Magnesium was found to have a direct inhibitory effect on automatic tissue (plain and cardiac muscle) and a depressing effect upon the irritability of the non-automatic striped muscle. This influence is slow to wear off after the application but seems generally to favor the longer activity of the muscle—in other words, it is conserving in character. Magnesium appears to be the element to which we may look with most reason when seeking an agent that shall suspend katabolic changes without permanently damaging living structures. It is clearly less hurtful than potassium in like concentration. Comparison of magnesium with potassium shows that the former is not so distinctly the antagonist of calcium as is the latter. It also seems probable that the power to mediate vagus inhibition, which Howell fixed upon potassium, is a unique property of that element and not shared by magnesium.

*On the Extracellular and Intracellular Venom Activators, with Special Reference to Lecithin, Fatty Acids and Their Compounds.*—HIDEYO NOGUCHI.

Calcium chlorid stops venom hemolysis caused in the presence of oleic acid or soluble oleate soaps, but not that induced by lecithin. In the majority of serums, including those of man, horse, guineapig, rabbit, cat, rat, hen, pigeon and goose, there exist greater or less amounts of venom activators, and they can be completely inactivated by calcium chlorid. Judging from the fact that lecithin in an available form is not affected by this salt it is not likely that these serums owe their venom activating property to lecithin. As these activators are also extractable with ether they probably are nothing else than certain fatty acids, and, probably, soluble soaps. Dog's serum offers an exception to this, and contains, beside fatty acids and soaps, also activators of the nature of lecithin, for calcium chlorid fails to stop completely its venom activating property. This lecithin-like activator is not extractable with ether, but is precipitable together with the serum globulin by half saturation with ammonium sulfate. While the serum globulin falls out as a precipitate during dialysis this activator

remains in the solution, from which a large percentage of lecithin is extractable with warm alcohol. In many respects this appears to be a protein compound of lecithin and possibly is identical with Chabrie's albumon, which seems to be absent from the majority of normal serums, which develops in any serum heated to coagulation, and which renders all serums equally venom activating. Ovovitellin is another form of protein compound containing lecithin in available form for venom. On the other hand, pure serum globulins or serum albumins are not venom activating, notwithstanding their content of alcohol extractable lecithin. Non-activating serum can be made activating by adding small quantities of oleic acid or oleate soaps.

The degrees of susceptibility of corpuscles are parallel to the amounts of fatty acids which they contain. The absence of fatty acids is associated with total insusceptibility of the corpuscles to the hemolytic agent of venom. The amounts of lecithin extractable from corpuscles are about the same in different bloods and bear absolutely no relation to susceptibility. The addition of adequate amounts of calcium chlorid stops venom hemolysis with washed corpuscles of susceptible species. A previous addition of a small amount of lecithin annuls protection by this salt. A small amount of oleic acid or soluble soap, which is insufficient to produce hemolysis alone, can render the corpuscles of insusceptible species hemolyzable by venom. An oily substance can be extracted with ether from the stroma of susceptible corpuscles, but not from the insusceptible varieties. This oily mass is venom activating but contains no lecithin.

*On the Influence of the Reaction, and of Desiccation, upon Opsonins.*—HIDEYO NOGUCHI.

The author found that opsonins were most active in neutral liquids. An alkalinity exceeding  $n/20$  KOH prevented opsonization. An acidity of  $n/30$  HCl was sufficient to stop the opsonic function of serum. Neutralization of excessive alkalinity or acidity caused reappearance of opsonic activity. On the other hand, an alkalinity or an acidity approaching that of the normal alkali or acid produced a condition of irreversibility of the inactivation. The opsonic index, estimated in the alkaline reacting normal serum was far lower than that in a neutral medium.

The high stability of opsonins against desiccation and the high thermostability of dried opsonins are very striking. Almost no reduction of opsonic strength is evidenced after a serum is completely dried at  $23^{\circ}$  C. within a few hours. In the dry state, opsonins are well

preserved even after two years. Temperatures below  $150^{\circ}$  C. do not destroy opsonins in the dry state. After heating at  $150^{\circ}$  C. dry serum becomes difficult to dissolve, but opsonins may still be detected in it.

Complements withstand desiccation and dry heat in a manner similar to the resistance of opsonins.

*On Decomposition of Uric Acid by Animal Tissues.*—P. A. LEVENE and W. A. BEATTY.

In these experiments uric acid was subjected to the action of spleen pulp in the presence of 2 percent of ammonium hydroxid and 2 percent of acetic acid. Under both conditions 50 percent of the uric acid present was decomposed. Allantoin was one of the decomposition products.

*On the Diuretic Action of Thymin.*—P. A. LEVENE.

The experiments were carried out on a dog with an Eck fistula. The dog had been kept on a purin-free diet many weeks before the experiment was begun. For three weeks preceding the experiment the water consumed by the dog and the urine eliminated were carefully measured. It was noted that administration of thymin was followed by marked diuresis.

*On Lysinglycyl Obtained in the Tryptic Digestion of Egg Albumen.*—P. A. LEVENE and W. A. BEATTY.

In the process devised by the writers a year ago for preparing the peptid, prolinglycyl, a substance was produced from egg albumen, which, on further cleavage, yielded only lysin and glycocoll. The substance could not be crystallized. The authors called attention to the fact that peptids of the hexon bases obtained by Fischer and Suzuki synthetically also failed to crystallize.

## DIGEST OF LITERATURE.

### LECITHIN.

BY

ALFRED HEINEBERG, P.D., M.D.

Since the recognition of the decrease in the phosphorized fat of nerve cells and the presence of an increased quantity of phosphoric acid in the urine in certain disorders of the nervous system, many attempts have been made to supply this deficiency by the administration of phosphorus and its compounds. The ingestion of phosphorus in its pure state was not productive of uniform results owing perhaps to the difficulty of its assimilation. The employment of phosphoric acid, phosphates and phosphites proved ever more disappointing, for unless

given in amounts too large for practical medication they exercised none of the characteristic effects of the element. While the complete physiologic action of phosphorus is as yet imperfectly understood the experiments of Wegner<sup>1</sup> would seem to prove that it definitely stimulates the production of bone in the provisional cartilage of growing animals and produces a narrowing of the Haversian canals and medullary cavities of the lesions after maturity. Other effects attributed to it when taken in small doses are betterment of the appetite, increase in the number and hemoglobin content of the red blood cells, depression of tissue waste and greater activity of the nervous system, but as stated before, these results are not uniformly obtained from any inorganic preparation of phosphorus.

In lecithin we have an organic compound rich in phosphorus, and judging from experimental studies and clinical reports the most satisfactory preparation of this element yet introduced into medicine. Its wide distribution and importance in the animal economy and its ready assimilability tend to support this view.

It exists in all tissues of the body, being found by Bernheim and Dieupart<sup>2</sup> in the following percentages; white matter of the brain 11, gray matter 2.5, thymus gland 7.51, liver 2.22, spermatozoa 1.5, erythrocytes 0.72, chyle 0.83, etc. From the yolk of eggs Laves<sup>3</sup> extracted 8 to 9 percent. From the cortical substance of the suprarenal gland Labbe,<sup>4</sup> Bernard and Bigard recovered about 2.08 percent. Donath Julius<sup>5</sup> found it in the cephalospinal fluid of a case of tabes and in one of Jacksonian epilepsy. Bordas,<sup>6</sup> Billou and Duclaux determined its presence in milk to the extent of about 0.50 per liter. Not only is it found in animal life but its existence in vegetable life, partly in chlorophyll, has been demonstrated by Schagdenhauffen and Reer in beans, lentils, fungi, etc.

While lecithin from these several sources differs somewhat in its chemical composition, that from animal life is generally considered to be a salt of glycerophosphoric acid and some of the fatty acids, oleic, palmitic, stearic and butyric with the bases cholin (trimethyl-oxyethyl-ammonium hydrate) and newrin (trimethylvinyl-ammonium hydrate). The fatty acids with which it is combined in animals are replaced by other acids in vegetables.

When pure it occurs as an amber-colored, waxy substance, almost odorless, soluble in alcohol, ether, chloroform and benzine. Added to water it swells up, but does not dissolve and is gradually decomposed with the precipitation of the cholin. Heated to 70° C. it undergoes de-

composition. It is obtained on a commercial scale almost wholly from yolk of egg in which it exists in combination with albuminoids as vitellin. Great difficulty is encountered in freeing the lecithin from the albuminoids, fats and other substances in egg yolk which cling to it tenaciously, and many processes have been devised which yield products differing somewhat in their chemical as well as physical characteristics.

The lecithin obtained by the methods of Hoppe-Seyler, Diakonow and Strecker corresponds to the foregoing description.

Serona's product occurs in a saline emulsion, Fairchild's in solution (the solvent not being mentioned). Borders<sup>7</sup> recovered it from milk. Although lecithin has been known since 1846, when it was discovered and named by Gobley, and again isolated by Hoppe-Seyler in 1870, its value as a therapeutic agent was not recognition until after Danilewski<sup>8</sup> published, in 1895, the results of his experiments.

This physiologist found that young animals fed upon it evidenced a distinct rapidity of bodily growth with a proportionate increase in the size of the brain. He noted also that one of the first effects was an augmentation in the number of erythrocytes. These results were subsequently verified by Desgrey and Zaky,<sup>9</sup> who discovered in addition that after the administration of lecithin either by the mouth or subcutaneously the elimination of nitrogenous waste in the urine was nearly doubled, while phosphoric acid was diminished about one-third.

The later investigations of Hatai Shin Kiski<sup>10</sup> who employed in white rats a lecithin prepared by Professor Koch<sup>11</sup> and those of Gilbert and Fourniers,<sup>12</sup> Stassano and Billou confirmed the foregoing conclusions.

"From these observations the deduction was made that lecithin served to exert a favorable action on nutrition, manifested by an augmentation of nitrogen elaborated, an increased fixation of phosphorus and a marked increase in body-weight" (Bleyer<sup>13</sup>). (A multiplication of red blood cells and their enrichment in hemoglobin.)

Serona<sup>14</sup> was the first to apply it as a remedial agent. He employed it with beneficial results in a large variety of diseases including neurasthenia, diabetes, nephritis and tuberculosis, but most efficiently in chlorosis.

Fürst<sup>15</sup> found it very valuable in cerebral exhaustion and neurasthenia. Claude and Zaky report favorably on its effect in tuberculosis. They claim no specific action upon the bacillus tuberculosis, but attribute the good results to the betterment in nutrition.

Lancereaux used it effectually in diabetes and osseous tuberculosis, Houchard in chlorosis, gastric ulcer and Parkinson's disease.

The usual dose is from three to six grains a day by mouth.

Another interesting field of usefulness of lecithin may develop from the experiments of Werner,<sup>16</sup> suggested by those of Schwartz,<sup>17</sup> who found that when eggs were exposed to radium their lecithin became radioactive. Werner produced similar results in solutions of lecithin by exposing them to both radium and the röntgen ray and suggests that the injection of such activated solution might be of benefit in the treatment of deep-seated malignant growths.

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## RECENT EDITORIAL OPINIONS.

**The Journal of the American Medical Association.**—THE FREQUENCY AND THE MARITAL CONSEQUENCES OF GONORRHEA: On the basis of the ideas of Ricord, Lesser and others, it seems to have been generally accepted that at least 80 percent if not 90 percent of all men have suffered from gonorrhea at least once. Noeggerath and others have written much on the prevalence of female suffering from masculine unchastity. On the other side of the question Erb has found that of 2,000 male patients representing all classes 48.5 percent had had gonorrhea, while 45 percent had had neither

gonorrhea nor syphilis. Of the wives of 400 of Erb's patients who confessed to having had gonorrhea previous to marriage 93.75 percent had never suffered from pelvic infection that could possibly be of gonorrheal origin and but 4.25 percent had had what probably were gonorrheal infections. The conditions at best are bad enough to create a proper respect for the penalties of unchastity provided these are thoroughly understood.—THE PHYSIOLOGIC ACTION OF LIGHT: Excessive amount of light exerts a deleterious effect, especially on the nervous system. As a consequence, neurasthenia is more common in tropical countries as pointed out by King, Woodruff, and Fales. They believe that light and not heat is the cause of the condition. A contributing cause is probably the fact that Americans do not adjust their habits to climatic conditions but try to live as active lives in the tropics as in the northern United States. People who are darkly pigmented stand sunlight much better than others, a fact of definite application in certain phases of the treatment of tuberculosis. The fact that sunlight kills pathogenic germs is of itself beneficial. If too much sunlight, however, is bad for germs it may also be harmful for human beings. Another fact brought out in recent years is that cloudy climates where there is not much light are the most suitable for neurasthenic conditions. Major Woodruff is of the opinion that suicides and crimes and misdemeanors are much less frequent during cloudy weather than during sunny weather. Certainly this is contrary to general impression and especially in the matter of statistics. The exact action of light is, therefore, extremely important and requires much more careful observation to determine its exact influence and power.—CANINE PIROPLASMOSIS: Piroplasma is a minute intracellular parasite first discovered by Theobald Smith in the blood of cattle affected with Texas fever. Similar parasites have been found in other animals in all of which the symptoms are practically the same and consist of anemia, hemoglobinuria and usually some jaundice. The infection is conveyed by the tick bite. Nuttall and Graham Smith have shown that the life cycle, as passed in the blood of the dog, consists of a small pyriform body which enters the blood corpuscle, passes through a round stage and an active ameboid stage. This is followed by the protrusion of two pyriform bodies with a diminution and finally a disappearance of the original body of the parasite. The pyriform bodies are finally set free to enter

other corpuscles. Texas fever, perhaps the most important of the *Piroplasma* infections, is very common in the United States and a piroplasmosis of sheep has been reported in one of the western States. It is possible that the spotted fever of the Rocky Mountains may prove to be a form of human piroplasmosis.—**LATENT DIPHThERIA:** Although there is considerable obscurity as to whether or not all the diphtheria-like bacilli are to be classed together, we may take comfort, however, in the fact that careful investigations show but a very minute proportion of actually virulent bacilli in the throats of healthy persons and that the contagion of diphtheria is generally rather direct. So that much may be done by the use of immunizing doses of antitoxin and the judicious control or isolation of persons who have been exposed to the disease and who have the bacilli in their throats even though they do not present any signs of the disease. According to Dr. Solis-Cohen, if a person has not been exposed to diphtheria, the presence of such germs may be disregarded provided there has been no antecedent sore throat. Further investigations on the relation of the Hoffman and the Klebs-Löffler bacilli are necessary before the sanitary control of the disease can be put on a firm basis.—**ABDOMINAL ARTERIOSCLEROSIS:** The association of intermittent abdominal conditions with arteriosclerosis of the vessels of the abdominal viscera has been the subject of a recent article by Perutz. He shows that a variety of clinical pictures may be associated with abdominal arteriosclerosis and that in some cases of thoracic arteriosclerosis the symptoms are referred to the abdomen, making errors in diagnosis likely. When such symptoms as pain, vomiting, distention, constipation and even gastric hemorrhage occur intermittently in an individual with wellmarked arteriosclerosis, and are relieved by medicaments directed against the arterial condition we are justified in suspecting that abdominal arteriosclerosis is at the root of the matter. The essential lesion seems to be a spasm of the vessels, and it is a question whether the pain originates in the walls of the spastic vessels or is due to the indirect influence of the circulatory disturbance on the nervous system.—**THE PLAGUE OF RATS:** This pest is more frequently, than we imagine, a disseminator of disease. It is probably almost entirely responsible for the propagation of bubonic plague from port to port and probably has an important part in the transmission of typhus and typhoid fevers and tuberculosis,

and probably also in that of trichinosis and hydrophobia. For this reason and because of its great tendency to rapid multiplication, measures for its destruction are of considerable importance. Among these are poison, traps, ferrets and fumigation, and yet after all probably the best means of eradication is the proper construction of buildings with due attention given to sanitation and to the proper disposal of sewage and waste.—**MEDICAL ADMINISTRATION AND MEDICAL RESEARCH:** Dr. Ronald Ross makes a severe indictment of the methods of British medical administration in India in a recent communication. He states that during most of his eighteen years' service in the Indian Medical Service there was no encouragement for efficiency, examinations for promotion were unknown, leave and opportunity for study could scarcely be obtained and apparatus was generally unsupplied. In some cases, men like King and Haffkine have actually suffered because of their investigations. At present Ross admits that matters have somewhat improved, but there is still in his opinion too little encouragement of scientific work by medical men in the British government employ. While we cannot charge our own national government with discouraging scientific, medical, or other research, it is failing to recognize the need of maintaining a medical corps that will be sufficient in case of emergency.—**THE MODE OF ACTION OF THE FINSEN LIGHT:** When Finsen, in 1896, introduced the use of concentrated light rays into therapeutics, he did it chiefly with the idea that the light rays acted by destroying the bacteria in the tissues without injuring the tissues themselves. Later Bang showed that whereas the chief bactericidal power of light depends on certain of the ultraviolet rays, it is these very rays that have the least power of penetrating the tissue. Jansen, in the Finsen Institute at Copenhagen, has found that the capacity of the therapeutic lamp to disinfect tuberculous tissues is extremely small and that the same degree of exposure kills epithelial cells to even a greater depth than it will affect bacteria and causes a severe serohemorrhagic exudation and thrombosis. Connective-tissue cells are much less affected and exposure to light is followed by a marked fibrous hyperplasia which is in no way a specific result of the action of the light rays but is a simple inflammatory reaction. Jansen concludes that the Finsen light acts as a form of caustic which acts most on the pathologic cells, sparing the connective tissue, thus favoring regenerative

activity. Only the ultraviolet rays have any considerable effect on the tissues.—**HYGIENE VS. FEEDING IN INFANCY:** From investigations recently made in Great Britain and from similar studies in this country it seems that correct feeding of infants is a more potent factor in the development of healthy children than hygienic surroundings. Notwithstanding the most unhygienic and unspeakably squalid surroundings in which the poorer class of Jews live, their children show better health and better physical development than do gentile children under better hygienic conditions. The explanation for this probably depends on the fact that Jewish mothers invariably nurse their infants and the older children have a food richer in fats and oils than do the gentile children. Another factor of importance is the fact the Jewish mother practically never works in factories, sweatshops, etc.—**THE MOST IMPORTANT FACTOR IN INFANT MORTALITY:** We hear much of mills and their dangers, of crowded tenements and long-continued heat, of uncleanly quarters and garbage accumulation, but there is one factor in modern infant mortality of which we hear little and yet which is of even greater importance than all of these and that is the failure of mothers to nurse their children. Some mothers are not physically able to do so but they constitute but a small percent. Censuses in Berlin show that the number of infants nursed by mothers have decreased from 50 percent in 1890 to less than 25 percent at the present time. City women are much more ready to escape this duty than are those who live in the country, but it is probable that the state of affairs in Berlin is not worse than that which is developing at the present time in our own large cities. It is evident that, if the high deathrate among so-called nursing children is to be reduced, the influence of this factor must be guarded against much more than it has been in the past.—**THE SPONTANEOUS HEALING OF CANCER:** There are occasional instances according to Czerny in which persons with cancer too far advanced for complete removal have improved greatly after palliative local procedures and in a few cases have shown no recurrence of the growth and no development of metastases. In other instances operation seems to change a slowly growing, mildly malignant tumor into one of rapid growth and marked malignancy. Lubarsch believes that the formation of metastases from cancer does not depend solely on the cancer cells but also on inhibition of the

normal resorption processes brought about by the presence in the blood of poisonous substances coming presumably from the primary growth. Or the process may be one of self-immunization. So that in the operative manipulation of the primary growth considerable quantities of cancerous material may be forced into the circulation and the results may be either (1) a widespread dissemination of the disease, or (2) in case the resistance of the body were sufficient these cells would be destroyed and in the process cause the formation of antibodies sufficient to overcome the secondary growths which had attained a foothold.—**THE FUTURE OF THE TROPICS:** The recently expressed prophecy of Colonel N. T. Gorgas that within the next two or three centuries the tropical countries will be settled by the white races, may not prove a strictly correct prophecy, but its possibility cannot be denied as once it would have been. The advances in bacteriology have done much to overcome many of the drawbacks to the habitability of these regions by the white races and have opened for the use of civilized man large portions of the earth's surface that were formerly practically forbidden to him. The question still remains whether the white man can retain his physical stamina and energy through residence in the tropics for many generations, and whether the productiveness of tropical regions of itself will not prove a drawback. The tropics will become more habitable than they have been in the past but the higher civilizations will doubtless continue to occupy the temperate zone.—**SURGICAL INJURY OF THE PARATHYROIDS:** Sandström, in 1880, was the first to describe accurately the "glandulæ parathyroideæ." Since 1895 much has been added to our knowledge of their functions and their relation to disease. Following the idea of Gley it seems probable that the developmental and metabolic disturbances following removal or disease of the thyroid depend chiefly on the absence of the internal secretion of this gland itself; whereas the acute nervous manifestations, often with the typical picture of tetany, that may follow operative injury of the thyroid depends on interference with the function of the parathyroids. Administration of parathyroid tissue does not seem to compensate fully for loss of the function of these organs, although it is undoubtedly of value. Von Eiselsberg and Halsted have transplanted parathyroids with good results. The latter believes that the spleen will be found a suitable site on account of its great vascularity.—

**PATHOLOGY OF DREAMS:** Sleep still maintains much of its mystery in spite of scientific advance. Dreams constitute a manifestation of intellectual life and require the exertion of a certain amount of brain force or mental energy and so are to be avoided. There seems to be a tendency in the present day to cultivate habits of mind which rather encourage dreaming, such as the telling of dreams or listening to the tales of the dreams of others. Children are especially affected in this way and there seems no doubt that many of the illustrated supplements of our Sunday newspapers cultivate the tendency to dream. Elements like this in the education of children often mean more than the formal factors of school work in their effects on the nervous system. Both adults and children should cultivate as far as possible dreamless sleep, which in many cases will be furthered by a delicate curtailing of indulgence in reading or gazing at pictures which might tend to increase dreamfulness.—

**A NEW CUTANEOUS REACTION IN TUBERCULOSIS:** Pirquet has found that if a small quantity of diluted tuberculin (old) is placed on the skin of a tuberculous child and a small scarification is made right through the drop there will appear at the point of inoculation a small papule not unlike the papule of vaccination, at first bright, later more dark red and lasting about eight days. In 500 tests a positive reaction was obtained in nearly all the cases of clinical tuberculosis in infants. The test seems to possess diagnostic value principally in the case of patients in the first year of life. The most characteristic reaction occurred in cases of tuberculosis of the bones and glands. Vallée has found that no reaction occurred after similar vaccination of healthy animals, while in animals affected with either recent or old tuberculous lesions the reaction appears equally as distinct as in tuberculous infants. No theoretic explanation of the phenomenon has as yet been made but it probably indicates an increased degree of sensitiveness of the skin to infectious material on the part of those suffering at the time with actual infection by the corresponding microbe.—

**TAXING HOSPITALS:** Hospitals that receive pay patients are subject to taxation in Illinois and there is apparently no provision for any reduction for the amount of charity work done. The rank injustice and bad public policy of thus taxing charitable institutions is evident. Private hospitals that are run for profit or to accommodate a profitable practice may justly be taxed like any other property but those that

receive charity patients to an appreciable amount have a right to demand public support.

**The Boston Medical and Surgical Journal.**—**RUSSELL SAGE INSTITUTE OF PATHOLOGY:** Mrs. Russell Sage has given the sum of \$300,000 to found the Russell Sage Institute of Pathology as an adjunct to the City Hospital and the City Home on Blackwell's Island, New York. Dr. Janeway in submitting the plans to Mrs. Sage explained the purpose of the institution as twofold: First, research into the problems of disease and more especially the diseases of advanced life; and, second the improvement of the city's poorest sick and aged in two of its largest institutions.—

**ENDOWMENT OF RESEARCH IN MUNICIPAL INSTITUTIONS:** The gift of Mrs. Russell Sage referred to above is the first instance in this country in which a large sum of money has been given for the purpose of stimulating investigation in institutions under the immediate control of a city government. In this case the cooperation of the city government and charity organizations has been secured to the common end of applying this large sum of money to a definite and highly useful purpose. The gift also makes possible the study of a vast amount of material which has in the past too often been neglected and ignored. The example which it has set should be followed in every large city.—

**A MEDICAL MEETING IN TURKEY:** During the last week in July, the first medical meeting to be held in Turkey took place at Aintab, having been planned by the American Board of Foreign Missions. The Oriental is slow in adopting modern methods and the loss of life resulting from ignorance has been and still is appalling. In surgery the native profession is peculiarly ignorant. The native doctors were welcomed at the meetings which were designed to give instruction through illustrations and by other means in matters relating to bacteriology and pathology. Such a meeting cannot fail to give better medical conditions to the native population throughout the country.—

**HEALTH INSPECTION IN MASSACHUSETTS:** Massachusetts has recently passed a law providing systematic medical inspection throughout the State. The State has been divided into 15 districts and carefully chosen inspectors have been placed over them. The inspectors are expected to cooperate with the local Health Boards, and in the matter of factory inspection they are to supersede the district police. The salaries are fixed in relation to the territory, the number of the

inhabitants, the character of the industries and the amount of time required for the proper discharge of duties. The scheme will be watched with much interest by the medical profession, sanitarians and all who are interested in the public health.—**DERMOID CYSTS OF THE ANTERIOR MEDIASTINUM:** Naudrot has collected a series of dermoid cysts of the anterior mediastinum. Although of congenital origin these cysts clinically develop only at the time of puberty, when they undergo a change similar to that manifested by the genital apparatus and breasts of the female. In some a thymic origin is admitted. The symptoms are dyspnea, thoracic and intercostal pains and paroxysmal cough accompanied with hemoptysis or a more or less characteristic expectoration if the cyst ruptures into a bronchus. Hair has been found in nine out of 56 cases. The patient dies of asphyxia or cachexia, the evolution of the affection taking from three to eight years. In the way of treatment, surgical interference gives a successful result in about 70 percent of cases and consists of thoracotomy followed by pleurotomy and ablation of the growth or thorough evacuation of its cavities.—**THE RESULTS OF SECTION OF THE SYMPATHETIC IN ESSENTIAL EPILEPSY:** Many and very varied have been the results of this procedure as reported by various observers. Much difficulty has been encountered in accurately diagnosing the condition and this factor alone accounts in a measure for the variability of results. Opinions are expressed for and against the operation. After all, to try to apply a uniform treatment to cases having a varying pathogenesis must of necessity lead to therapeutic failure. The operation cannot be curative. The relation of cerebral circulation to the attacks should be investigated. The operation is of little value and a more complete knowledge of the various forms of epilepsy and their pathogenesis would allow one to come to a better conclusion as to the advisability of operative treatment.—**OPPORTUNITIES FOR MEDICAL WOMEN:** Dr. Osler recently pointed out four channels open to women physicians. The first of these was in work in connection with the laboratory branches of medicine, the second was in connection with institutions and particularly those in which the insane are treated, the third in so-called general practice especially in the diseases of women and children, and the fourth, especially for English women, in work in India in ameliorating the diseases and condition of their own sex. Dr. Osler

does not mention as an appropriate field that of surgery. The real problem before women physicians is to determine the sphere of usefulness in which they may most fully develop and then devote their best energies to its cultivation.

**Medical Record.**—**DIET AND STERILITY:** Many of the ills of modern life have been attributed to injudicious eating and now Dr. Malcolm Campbell, of Edinburgh, would add, tentatively, a diminution in the birthrate. He examined the uteri of rats kept on various diets using the uteri of wild rats as representing the normal structure. The uteri of rats fed on milk and bread soaked in milk approximated most nearly to the type of structure in the wild rat. The use of an exclusive flesh, rice or porridge diet induced a modification in the structure of the uterine mucosa. In animals fed from weaning on an exclusively flesh diet there was marked interference in the development of the uterus associated with sterility in the majority of cases. There is no doubt that an excess of meat in the dietary, as an excess of food of any kind, is injurious, and the more so the less the eater lives in the open air; but it may be also that it is the quantity rather than the quality of food that injures the eater.—**THE INFLUENCE OF METEOROLOGIC CONDITIONS, REFUSE HEAPS, ETC., ON THE BACTERIAL CONTENT OF URBAN ATMOSPHERE:** C. J. Lewis has recently published the results of his experiments on this subject. Rain washes the organisms out of the air into the soil, the extent of purification of the air being in direct ratio to the duration and heaviness of the fall. As regards the effect of wind it was found that there was an excess of organisms to leeward over those to windward. Furthermore on the windward side there were found generally harmless organisms while to leeward were organisms of putrefaction and of sewage origin. There was a direct proportional numeric relation between dust particles and the organisms deposited at the same time and place, both being very high in places where there was heavy and rapid traffic. Locality, densely populated districts, refuse heaps, and polluted soils were all found to have a notable influence upon the numbers and character of the organisms present in the atmosphere.—**THE INTERNAL TREATMENT OF ACNE:** Kapp has found in the urine of 30 young patients afflicted with acne a marked increase in the quantity of indol, indican, and a number of similar substances. This is evidence of intestinal decomposition of high degree and as diminished intestinal peristalsis is usually

present particularly at puberty, we have at hand two main factors in the production of the lesions. Treatment should be directed toward reducing fermentation and increasing peristalsis in the intestine. Kapp suggests precipitated sulfur and menthol as an efficient remedy.—**HYGIENIC REQUIREMENTS IN BOOKS AND JOURNALS:** Professor Edmund B. Huey in a recent article discusses this subject. Among other things he shows that the optimum type is of the size called eleven pointed and the space between the letters should be from 0.3 to 0.5 millimeter. The proper amount of leading or the spacing between the lines and the length of the lines are also important. As regards books, those of smaller size are preferable as they can more easily be adjusted to the eyes than can those of larger size and greater weight. The paper should be without gloss. He quotes Shaw to the effect that if books with small type and insufficient leading were rejected the makers of such books would very quickly bring out new editions with the proper size of type.—**THE RUSSELL SAGE INSTITUTE OF PATHOLOGY:** In giving the sum of \$300,000 for the purpose of endowing an institute for pathologic research to be connected with the City Hospital and City Home on Blackwell's Island, Mrs. Sage has indicated a new field for benefaction by public-spirited citizens of wealth. By the establishment of such a fund the control of the laboratory is definitely removed from the sphere of political influence, the extremely valuable material of the city's institutions can be satisfactorily studied by salaried investigators, special research work can be provided for, the necessary equipment and library facilities can be supplied and the results obtained can be published in suitable form. This gift finally will mean better care for the aged and the chronic cases and makes possible the study of the maladies and tissue changes of middle life and senescence.—**THE SIGNIFICANCE OF MONGOLIAN PIGMENT SPOTS:** For centuries Japanese writers have discussed the nearly constant presence in the sacral region of irregular areas of bluish pigmentation in recently born children of their race. Similar areas are found in 97 percent of pure Chinese and in other mongolian peoples. In 1903 Adachi found cells similar to those in the bluish areas of Japanese and Chinese in the skin of white children though blue spots could not be made out. Breunmann more recently found similar cells and wellmarked areas of bluish pigmentation in the skin of American negro

children. It would seem, therefore, that these spots formerly considered a distinct mongolian racial characteristic are a human characteristic found in different degrees in all races.—**THE RELATION OF TRANSIENT GLYCOSURIA TO DIABETES:** Von Noorden has recently expressed the opinion that transient glycosuria, not due to a diet excessively rich in sugar, has a tendency to be followed by diabetes. Barringer and Roper in a recent communication show that of 20 patients who had shown a transient glycosuria only four had developed mild diabetes five to eight years later. Of 18 of these patients nine showed a disturbed sugar metabolism five years after the first discovery of sugar. They conclude that alimentary glycosuria arising from glucose or cane sugar, provided the test is properly conducted and repeated at intervals, affords an indication as to whether the spontaneous transient glycosuria will develop into diabetes.—**AN OBJECT LESSON IN CAMP SANITATION:** The admirable condition of Camp John Smith where the United States troops are quartered just outside of the Jamestown Exhibition is an excellent example of the effectiveness of modern scientific and sanitary precautions. The morbidity of the troops is only about three percent and this in a military camp pitched in a malarious swamp in a region which is no stranger to typhoid fever. These good results are due to the energy, activity and foresight of the Chief Surgeon, Major Charles E. Woodruff, though he is disposed to give the credit to Dr. Jones, his assistant, upon whom much of the routine executive work has fallen.—**MEDICAL SCIENCE AND THE DEATHRATE:** The lowering of the deathrate in recent years is not due altogether to increased medical and surgical knowledge and skill. There is an interdependence between the birthrate and the deathrate which has an important bearing on these figures. Dr. Tatham has shown that in the past 40 years there has been an indubitable fall in the mortality of both sexes in England amounting to 3.55 per 1000 population. In infant mortality medical science has so far found the greatest inability to effect marked improvement. There has been a marked fall in the number of deaths due to tuberculosis in the past 40 years in England, while cancer on the other hand has shown an alarming increase. The conditions in the United States are better than in England, at the same time the situation in this respect is susceptible of much improvement and especially in the large cities.

**New York Medical Journal.**—A CASE OF PLAGUE IN SAN FRANCISCO: The recent admission to the Marine Hospital, San Francisco, of a patient suffering from bubonic plague has offered an opportunity for the San Francisco Board of Health to show what may be done in the way of plague prophylaxis. The rats in the localities frequented by the patient should be killed and examined for *Bacillus pestis*, and if any are found so infected, the locality from which they come should be gone over most carefully, cleaned up, disinfected and cleared of its rat population.—ON A SPECIFIC ANTIBODY IN GENERAL PARESIS: Wassermann and Plaut have recently reported the finding of a specific syphilitic antibody obtained from the cerebrospinal fluid of general paretics. In some of the patients the blood-serum also gave a definite reaction to syphilitic antibodies. The presence of these antibodies in the cerebrospinal fluid seems to bear no definite relation to the age of the patient, duration of the illness or to its intensity. On the other hand, a marked variation may be found in individual patients at different times and it is possible that there exists a certain periodicity in the production of these antibodies. These investigators were unable to decide on the site of origin of these antibodies.—THE OCCURRENCE OF *Bacillus Dysenteriae* IN NORMAL AND DIARRHEAL STOOLS: In a study of the bacteriology of normal and diarrheal stools for the detection of organisms belonging to the dysentery group, Dr. Jessie Weston Fisher found that in nineteen diarrheal cases in which blood or bloody mucus was found in the stools, *Bacillus dysenteriae* of the Flexner type was present with two exceptions, in one of which a bacillus of the Shiga type was recovered and in the other an organism of the Duval lactose fermenting type was found. A "dysentery-like organism" called *Bacillus F* was recovered from 44.4 percent of normal stools, from 10.5 percent of stools from cases of mild diarrhea and from 0.01 percent of stools from cases of dysentery.—THE SERUM DIAGNOSIS OF MALTA FEVER: The agglutination test as an aid in the diagnosis especially of isolated cases of Malta fever has proved rather disappointing, due possibly to faulty technic or to a poor strain of the organism. Bassett-Smith, as the result of a study of the serum reaction in 150 cases occurring in the Haslar Hospital, believes that in acute cases the reaction is unmistakable, clumping occurring almost immediately. On the other hand, in chronic

cachectic cases, the reaction is often incomplete, slow and obtainable in low dilutions only. When the reaction is positive in a 1-30 dilution it may be considered conclusive of Malta fever past or present. A negative reaction does not, however, so positively indicate an absence of *Micrococcus melitensis*.—ON SUPRARENAL LESIONS AND NEPHRITIS: The relation of arterial supertension to suprarenal disease has attracted attention from many sides. Beujard is of the opinion that a cortical hyperplasia of the suprarenal gland forms a constituent part of the anatomic picture of interstitial nephritis along with cardiac hypertrophy. How this is to be interpreted in a physiologic light calls for explanation. So far as the facts at hand permit conclusions, it seems that in the course of chronic interstitial nephritis there is a hyperplastic reaction on the part of the entire suprarenal gland. The hyperplasia of the cortex is probably an antitoxic function while that of the medulla is not so easily explained. The medullary portion, however, secretes the chromaffin substance identical with adrenalin and the supertension of renal disease is probably due to the increase in medullary substance. So that while the cortical hyperplasia may be a reaction to chronic intoxication, that of the medulla is probably due to a necessity on the part of the organism for increased vascular tension. These changes then should be considered as compensatory reactions rather than as exciting agents.—THE TREATMENT OF MALTA FEVER WITH A VACCINE PREPARED FROM *Micrococcus melitensis*: Bassett-Smith treated two series of cases with vaccine prepared from a strain of the organism freshly isolated from the spleen during life. In the first series, 22 patients were treated, with marked improvement in 15. In the second series 23 patients were treated, with marked improvement in 16. There was no regular relationship between the agglutination and the opsonic curves, although the negative phase in Malta fever is often absent or very short. In acute phases of the disease the vaccine seemed to act detrimentally, while in the more chronic cases the vaccine seems to give the requisite quantity of stimulation to place the patient in a more favorable condition for combating the infective organisms present.—PANCREATIC ENZYMES IN THE TREATMENT OF CARCINOMA: Ball and Thomas have given the treatment of cancer by trypsin a thorough trial in the wards of the Middlesex Hospital following out the instructions of Dr.

Baird who first stimulated research along these lines. In none of their cases did trypsin accomplish any changes which are not already known to the familiar concomitants of the disease in its usual course. Beside the discomfort produced by numerous large hypodermic injections the treatment did not prevent a progressive loss of weight nor did the carcinomatous tissue show any retrogressive change.

—THE TREATMENT OF TUBERCULOUS DISEASE WITH THE HIGH-FREQUENCY CURRENT: Dr. H. Thiellé of Rouen, as the result of observations made during treatment by electricity upon 26 tuberculous patients comes to the conclusion that the high-frequency current augments the respiratory volume, diminishes the production of carbonic acid and the total consumption and absorption of oxygen by the tissues raises the proportion of hemoglobin and the number of red corpuscles and, while the leukocytes decrease in number they gain in strength. The general condition of the patient improves in all its aspects, the bacillus disappearing sooner or later.

DIGITAL DETUBATION: In many instances more difficulty is encountered in the removal of the laryngeal tube than in its insertion. Twelve years ago Dr. Bayeux discovered that it was generally feasible to dislodge the tube by external manipulation. This method however did not prove successful in cases where a long tube was used. Marfan has now devised a method which works as well with long tubes as with short ones. The child is placed on a table, face downward, the head and neck overhanging the table. The head is extended with the left hand while with the tip of the right forefinger the lower end of the tube is palpated in the sternal notch or above. Now the head is lowered and rather firm pressure is made upward upon the point of the tube which falls from the mouth as it is ejected from the larynx. The method is usually successful at the first trial and is devoid of difficulty.

—THE SUPRARENAL GLANDS AND PANCREATIC DIABETES: The introduction of suprarenal extract or the crystalline principles derived from it into the blood will produce glycosuria which is apparently due to an excessive formation of sugar in the liver brought about probably as a secondary result of the effect of adrenalin on the pancreas. Zuelzer has recently found that the injection of pancreatic extract at the same time with injections of adrenalin in animals was not followed by glycosuria. This would make diabetes mellitus the result of an exaggerated internal secretion of the suprarenal

glands. Normally the pancreas secretes a diastase capable of counteracting the injurious effects produced in the organism by excessive activity of the suprarenal glands. When the pancreatic secretion becomes insufficient for this, the symptoms of diabetes would appear. This explanation is novel and ingenious and deserves consideration. Objections, however, may be raised to it that in certain degenerative diseases of the pancreas we do not find glycosuria nor do we find in diabetes the high tension, bradycardia or other symptoms due to an excess of secretion of the suprarenals in the blood.

—SUDANOPHILIA AND SUPPURATION: In 1906 M. Cesaris-Demel described the presence of minute drops of some fatty substances in the protoplasm of leukocytes in the circulating blood, which fat reacted best to a staining mixture of Sudan III and brilliant creyl blue. The presence of this fat was supposed to be indicative of suppuration in some portion of the body. The reaction has received confirmation from a number of observers, among whom is M. F. Marchis who looks upon such leukocytes as developmental pus corpuscles. Cesaris-Demel, on the other hand, assumes that they represent phagocytic activity. Evidence as to their real origin and meaning is rapidly accumulating.

—LEUKOCYTE COUNTING FROM STAINED SMEARS: Methods have been suggested of estimating the number of leukocytes and even of the erythrocytes in a cubic millimeter of blood from stained smears. Larrabee has compared these various methods with that of counting with a freshly made dilution in the Thoma pipet. He found the error in counting from smears about 30 percent which makes the smear method too uncertain for universal adoption.

—THE "METASTASES" IN ECZEMA: Maille in a recent publication endeavors to explain all the cases of rapid death in children with eczema as due to a digestive autointoxication. In all of these cases the processes are comparable to those seen in uremia and sometimes in grave icterus. It seems as though the cutaneous lesion was merely the final stage of an hepatic and renal insufficiency.

—INTESTINAL INVAGINATION IN INFANTS: Kirmisson, to show the necessity of prompt operative intervention in intestinal invagination in infants, cites statistics showing a mortality of 14 percent after operations within 12 hours, gradually increasing to one of 78 percent at the end of four days. He insists that if ordinary measures do not at once prove efficient in relieving the condition laparotomy should be resorted to

without delay. Invagination may be diagnosed when the child passes blood by the anus and at the same time shows signs of violent colic and intestinal obstruction.

## NEWS AND NOTES.

**Vacancies in the Navy.**—There are 66 vacancies in the grade of assistant surgeon in the naval medical corps. This number will be reduced by so many of the eight acting assistant surgeons who were examined on July 1 for appointment to the regular establishment. All of these have been attending the naval medical school during the past winter and it is expected they would all be found qualified for appointment. These appointments will create additional vacancies in the position of acting assistant surgeons, making 15 in all.

**Antivivisection.**—A bill has been presented to the New York State Assembly providing for the restriction of research by experiment on living animals. It does not aim at the abolition of vivisection, but provides that experiments on living animals shall be attempted only under the authority of the faculty of a college or university incorporated under New York laws or under the authority of the State Commissioner of Health or a City Board of Health. The place where the experiment is conducted must be registered with the State Health Commissioner, who shall license the holder to pursue animal experimentation. Before and during the experiment the animal must be completely under an anesthetic. If pain is likely to be felt when the effect of the anesthetic has passed off the animal must be killed immediately. It is further provided that the experiment must be for the advancement of knowledge useful for saving or prolonging life or alleviating suffering.

**The Epidemic of Typhoid Around the Jamestown Exposition.**—It has been reported that a widespread and extensive epidemic of typhoid fever exists in the part of Virginia where the Jamestown Exposition is located. Quite a large number of deaths have occurred already. The mild cases are not called typhoid and there is a fear that the epidemic is much worse than the reports would indicate—bad as they are. Sanitary control of dairy farms is defective or wholly lacking and the infection is believed to be spread mostly in that way. It is also reported that quite a number of visitors to the exposition have carried the disease to their distant homes, so that the exposition seems destined to spread

the infection to all parts of the country. Virginia has no laws or organization which can cope with the situation, and the Boards of Health are practically powerless to protect the rest of the country or stop the epidemic. Their own health is now of national concern, as in the case of Cuba and Panama. There has been such criminal disregard of sanitation both in and around the exposition grounds, that the present epidemic could have been predicted.

**The Army Medical School.**—According to the *Army and Navy Journal* the Secretary of War has decided to lessen the requirements for medical officers of the National Guard to enter the Army Medical School. Hereafter no physical or mental examination will be required, and applicants will only need to furnish certificates from the governor of their qualification and good moral character. The last class from the Army Medical School was ordered to the Philippines, and sailed July 25 on the *Buford*.

**Free Distribution of Antitoxin.**—The Secretary of the Illinois State Board of Health recently announced that the law providing for the free distribution of diphtheria antitoxin by the board went into effect July 1, but that on account of the delay in the details of purchase and manufacture the supplies will not be ready for distribution before October 1. In the meantime physicians can secure antitoxin from any of the agents of the board without cost to the poor, on obtaining an order from the supervisor or overseer, as required under the Act of 1905.

**Transmutation of Metals?**—Sir William Ramsay is reported to have declared that by making use of radium emanations it is possible to "degrade" copper to lithium. This is being heralded as the realization of the alchemist's dream of the transmutation of metals. It will be recalled, however, that discussion of the transmutation of elements at the meeting of the British Association last year arising from the apparent production of helium from radium led to a vigorous controversy in which Lord Kelvin and other eminent men repudiated the transmutation theory, which was strongly supported by Sir Oliver Lodge and others.

**The Reed Memorial.**—Work on the new army general hospital, which will be a memorial edifice of the late Major Walter Reed, surgeon, is progressing favorably under the constructing quartermaster, Major Joseph T. Crabbs, U. S. army. The building has been

completed as far up as the third story, and it is expected that the portion which is under construction will be ready for use in the spring of 1908. Arrangements will be made for completing as rapidly as possible the entire project, which includes a large hospital and some 25 or 30 buildings in the way of barracks, quarters, laboratories, etc. It is here that the Army Medical School will be located and the reservation will be the garrison of two hospital corps companies, in all probability, when everything is in readiness.

**Suicides among school children in Germany** are stated to be greatly on the increase. Professor Eulenberg is reported as saying that during the last 12 years he has traced 1,152 cases of children's suicides, more than half of whom were driven to it by failure in their school examinations or overwork at school.

**Tuberculosis in the War Department.**—Owing to the discovery of five cases of tuberculosis among the employes of the insular bureau of the War Department, its rooms in the State, War and Navy buildings have been sealed and fumigated.

**From Weekly to Monthly.**—The *St. Louis Medical Review*, established in 1875 as a weekly journal and conducted for nearly three years under the efficient editorship of Dr. Kenneth W. Millican, with the issue of July 6, ceased to become a weekly publication and will be continued henceforth in a new series as a monthly magazine. Dr. Millican will be added to the staff of the *Journal of the American Medical Association* where his scholarly attainments will be of utmost value.

**The deathrate in New York City** is well below the mark for the corresponding period of 1906. During the week ended July 28, 1906, it was 17.11. This year the week ended July 28 had only a deathrate of 16.60 per 1,000.

**Barnes Medical College.**—After the close of the session of 1907-08, the Barnes Medical College will become the Medical Department of the University of the State of Missouri. Students for the session of 1907-08 will be registered upon the same basis as heretofore and all classes for that period will be conducted as formerly.

**Boycotting the Doctors.**—The people of Williamsport, Pa., are reported to have begun a boycott against the physicians of the city because of a recent advance in the rates made by the Medical Society. It is said that local physicians several weeks ago announced that

their rates would advance after August 1, and the people determined to boycott them by banding together and employing physicians from other places. The advance in rates amounts to more than 100 percent in most cases. Eight hundred families signified their willingness to join the combine to combat the Medical Society.

**Preservatives Made Legal.**—The Department of Agriculture has promulgated regulations governing the use of benzoate of soda and sulfur fumes as preservatives of fruits and other foods. The orders permit the use of common salt, sugar, wood smoke, potable distilled liquors and condiments, and, pending further investigation, the use of saltpetre. Pending the investigation no prosecutions will be instituted in the case of the application of fumes of burning sulfur (sulfur dioxide) as usually applied in the manufacture of food which contain acetaldehyde, sugars, etc., with which sulfurous acid may combine if the total amount of sulfur dioxide in the finished product does not exceed 350 milligrams per liter in wines, or 350 milligrams per kilogram in other food products, of which not over 70 milligrams is in a free state. Under like conditions sodium benzoate may be used in quantities not exceeding one-tenth of one percent, or benzoic acid equivalent thereto, provided sodium benzoate or benzoic acid has heretofore been generally used in such foods or food products. The question of the entry into the United States of vegetables greened with copper salts has not been finally determined. Pending decision of this matter by the Secretary of Agriculture, such vegetables will be admitted to entry if the label bears a statement that sulfate of copper or other copper salts have been used.

**Less Risk of Yellow Fever.**—An encouraging report about yellow fever infection in Central American countries is made by Dr. John N. Thomas, traveling inspector of the Marine-Hospital Service, with headquarters at New Orleans. He found Spanish and British Honduras in such a sanitary state of cleanliness as to minimize the danger of yellow fever infection from those countries. Guatemala, however, where yellow fever was reported early this year, was not so satisfactory, although officials of the Guatemala Northern Railroad are making a determined effort to clean the towns along the line and thereby remove the source of the recurring infection. The marine-hospital quarantine regulations at port towns are so well observed that there

is probably no danger of the fever spreading outside of Guatemala.

**Proprietary Remedies in Germany.**—At its last year's meeting the Freie Vereinigung der Deutschen medizinische Fachpresse, an association having as its members the editors of most of the prominent German medical journals, decided to prepare a list which should comprise the names of medical writers who are known to accept remuneration for laudatory articles written about proprietary remedies, the members of the association pledging themselves not to print contributions from these authors nor to abstract them. After careful investigation, in which it is stated that strangely enough many chemical firms were of great assistance, such a list has been prepared and distributed.

**The Woman's Medical Society of the State of Illinois** has been incorporated by Dr. Marion K. Bowles, Joliet, and Drs. Sara C. Buckley and Bertha Van Hoosen, Chicago. The purpose of the organization is to bring into communication the medical women of Illinois for the purpose of securing cooperation, promoting all objects of interest to women in medicine, and for increasing interest in, and the membership of, the Illinois State Medical Society.

**Cerebrospinal meningitis** has been added by the Illinois State Board of Health to the list of infectious diseases. Notification is required and public funerals of individuals dying from the disease are prohibited.

**Notifying Tuberculosis in Louisiana.**—The health officer of New Orleans has taken the first direct step to compel physicians to comply with the recent resolution of the city Board of Health to report tuberculosis. A circular letter has been directed to every physician of the city, stating that, aside from statistical purposes, the board had no intent other than to practice disinfection in such cases at the proper time (as often as may be required or indicated), and to supply the household with educational literature of a character agreeable and acceptable to the medical attendant.

**Tuberculosis Sanatoriums in Germany.**—The recent report of the German committee for the restriction of tuberculosis shows that great progress has been made during the past year in providing accommodations for the tuberculous poor. There are now in Germany 87 public sanatoriums with 4,822 beds, and 35 private sanatoriums with 2,118 beds, numbers which are said to exceed the total of

all the other public sanatoriums of Europe combined. Eleven other public sanatoriums with 800 beds are in the course of construction. There are also 17 institutions with 650 beds for children with advanced tuberculosis, and 67 institutions with 6,092 beds for less advanced cases of general tuberculosis in children.

**Exclusion of the Tuberculous.**—It is announced that the Texas health officer will, in a short time, order State quarantine against tuberculous patients in the advanced stage of the disease. The reason for this action is apparently because of the defeat of the tuberculosis sanatorium bill last winter in the Legislature, which passed the House, but was defeated in the Senate.

**For New Hospitals in New York.**—The Legislature has authorized a new site and buildings for the Randall's Island House of Refuge, a custodial asylum for epileptics, and an additional State hospital for the insane to be located near New York City. The plan of building this latter institution near Comstocks, Washington county, has been abandoned. The commission for choosing the site is to report to the Legislature in 1908.

**New York State Board of Charities.**—The State Board of Charities has appointed Dr. Gertrude E. Hall, of Albany, almshouse inspector, at a salary of \$1,200. The board adopted a resolution requesting the attorney-general to take an appeal from the decision of Supreme Court Justice Pitts in the case against the Bellevue and allied hospitals of New York City. The board sought to compel these hospitals to submit their plans for building improvements for its approval, but the judge decided that they need not do so.

**Rubber Stoppers in Germany.**—Owing to the fact that it is now considered that rubber containing antimony is not dangerous to health, the German government has rescinded a former measure making it unlawful to use rubber of this sort in connection with containers of foodstuffs.

**Want State to Pay Doctors.**—That the State should take over the treatment of all sick people is the almost unanimous opinion of the British Medical Association expressed in convention recently. In discussing a proposal that the sick should be treated at public expense, the points were made that the physician's work is now done under conditions involving the petty worries of fee collection, the stress of competitive commercialism and the sweating of the profession by hospitals, friendly societies and

similar organizations. The increasing number of cases treated at voluntary or State aided institutions was a phase of the movement.

**Plague in India.**—Returns of death by plague in India show an appalling total of 1,060,067 for the six months ended June 10. The monthly total is at present decreasing, however, the death roll for June being 69,465. The total for the six months of 1907 already surpasses that for the entire twelve months of 1904, when 1,012,000 persons died. This total is the highest ever recorded previously to the present year.

**Admit American Meats.**—The French government has notified Ambassador White that American meats may be brought into France upon the American certificates, and that microscopic examination will not be insisted upon. This ruling, however, is only temporary. No official decision has yet been communicated to the American Embassy in the matter of continuing the admission of Porto Rican coffee at the minimum import duty.

**Medical Battle Organization in the Navy.**—Some months ago the Surgeon General of the navy sent out to medical officers in charge on board ship for reports which would show the battle organization of the vessels in commission. The reports are being received by the Bureau of Medicine and Surgery and show that every ship has been properly organized for such drills.

**Leprosy in Boston.**—The Massachusetts State Board of Health is said to have confirmed the diagnosis of leprosy made in the Massachusetts General Hospital in the case of a woman who has recently been employed as a domestic servant in a number of well-known Boston families. The patient, who has been under treatment for a year as suffering from some obscure skin affection, has been sent to the State leper colony at Penikese Island, off the coast, near New Bedford.

**A Inexpensive Radioactive Substance.**—Numerous cable despatches have lately appeared describing a new radioactive substance possessing many of the properties of radium bromid, and capable of being produced very cheaply. A young medical student is said to have discovered it, but unfortunately later reports state that the new body has little or no practical value as a source of radioactivity.

**Tuberculosis Among New York Printers.**—Reliable statistics place the mortality among printers in New York City from 1901-1906, due to tuberculosis, at about one-fourth of the

entire deathrate of the craft. (It was 11 per cent for the whole city during the same period.) The causes of this large deathrate from tuberculous affections are, in large part, it is claimed, the poor ventilation of printing offices, the dust and dirt accumulations in the cases, the method of cleaning floors whereby their filth is set free in the atmosphere to be breathed into the lungs and the inhalation of gases from the molten metal.

**Novel Philanthropy.**—A wellknown Paisley (Scotland) manufacturer, James Coats, has in recent years sent a skilled oculist to travel throughout the Highlands, testing the eyes of those with defective and failing sight, and furnishing them with spectacles free of cost. In one district, that of West Sutherlandshire, no fewer than 500 pairs of spectacles were thus distributed recently.

**Horse and Dog Meat in Germany.**—In all Germany about 182,000 horses were slaughtered for food last year, an increase of 20,000 over the preceding year. The number of dogs eaten was perhaps 7,000.

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# American Medicine

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**Cold fresh air** was the subject of discussion at a meeting of the New York Academy of Medicine.<sup>1</sup> It is gratifying that there has been sufficient courage to violate custom and place the sick in the cold fresh air, where they belong. Dr. David Bovaird, Jr., showed that it was not only fresh air which was needed, but cold fresh air, and mentioned the fact that if children with ileocolitis could be kept alive until October, a cure could almost be guaranteed. Remarkable successes were reported, not only in tuberculosis and pneumonia, but puerperal septicemia, typhoid, neurasthenia, convalescence from scarlet fever, bed-ridden sciaticas and other chronic diseases. This change in hospital management was also preventing hospitalism.

**The open-air treatment of the insane** was described by Dr. Wm. Mabon, and it is quite evidently the proper method. Confinement in a house is bad for anyone, sick or well, and it must be especially harmful in the insanities. Perhaps the old prison-like asylums were really responsible for the high deathrate in former times. Slowly but surely the treatment of every disease is being changed by placing the patient in his natural environment—the open air. It seems to be the only thing needed in numerous instances. The pioneers in the modern management of the insane were strenuously opposed, but their wisdom has long been demonstrated.

**The danger of sunshine** was mentioned by Dr. John H. Huddleston, who referred to two children, convalescent from pneumonia, who suffered from sunstroke as a result of the sun bath. Dr. Alfred Meyer said that there was less danger from rain and snow than from sunny weather with its dust. There was a word or two said by other speakers, which showed that they still held to the view that sunlight was a factor for good, as well as the cold fresh air.

**The dangers of too much light** should be the subject of more comment than is given to them in current medical literature. The destruction of life, due to concentrated cold rays, should open our eyes to the lesser damage of smaller doses. Nature has heavily pigmented all the races in light countries and there seems to be no reasonable doubt that its purpose is protection from light. If so, then the blond races are injured if they expose themselves in light climates. Slowly facts are being reported which tend to the view that this is an extremely important practical matter in many directions. We have already called attention to the alleged greater mortality of the tuberculous blonds sent to light climates and their recovery in cloudy ones, and it is now thought that the same rule applies to many other diseases. There is considerable evidence of greater susceptibility to nervous disorders on the part of blonds in light countries, and the existence of a tropical neurasthenia now

<sup>1</sup>N. Y. Med. Rec., Feb. 9, 1907.

seems to be accepted by tropical experts. Its cause must be investigated, for if it is really due to excessive light, its prevention is a simple matter. The excessive summer light of our shadeless cities seems to be the fatal factor, and fully accounts for the wonderful change in city children who have a short residence in the country.

**Misinformation as to tropical climates** has been notoriously common, and as great harm is done it is necessary to call renewed attention to the matter. Dr. Wm. S. Washburn,<sup>1</sup> chief of the Philippine Civil Service, published an article on the climate of the Philippines, which showed an amazing ignorance of basic biological laws which a person in his position should know. He concluded that Americans appear to become acclimated during the third year of residence and that colonization of white men in the tropics was possible. He seemed to be wholly unaware of the fact that physique is evolved for climate and that a white man is as much out of place in the tropics as a negro in Greenland. He even stated that failure to maintain health was due to violation of the rules of hygiene, and that residence in the Philippines was as devoid of danger of disease and death as residence in the United States under similar conditions. The following news note<sup>2</sup> then has a scientific value. "Dr. W. S. Washburn, chief of the Philippine Civil Service, who recently returned to the Philippines after spending leave of absence in India and the United States, has again been compelled to request six months' leave of absence, for the purpose of proceeding to the United States on account of ill-health."

**Tropical stimulation** is responsible for many of the untrue reports from the tropics.

It is well known that for the first few months, or even a year or two, there is a marked nervous stimulation which deceives newcomers. Not infrequently they write home misleading articles which are pernicious because they induce men to go to the tropics who should stay at home. The real damages of the climate are unknown and ignored until the inevitable collapse. Dr. Washburn should have known these facts. He has evidently changed his mind, or he would stay in the Philippines to get well, if the climate is as good as he stated it was. All persons who go to the tropics should be warned of the preliminary stimulation, and they will then be more careful of their personal conduct and expressions of opinion.

**The effects of tropical climate on the white race** are being investigated by army surgeons in the Philippines, and a preliminary report has been published by Captain Edwin P. Wolfe,<sup>1</sup> assistant surgeon. He has made many blood-examinations which show nothing from which any generalizations can yet be made. He notices the nervous stimulation followed by neurasthenia, and observed the damage done by excessive marching, yet asserts that active men preserve health the longest. It is more reasonable to conclude that the strongest and healthiest preserve their activity the longest because they resist the enervation the best. Though he mentions the fact that there would be a study of the relative ability of blonds and brunets to stand the climate, he gives no observations, and says that the prolonged heat will explain all the ill-effects. In view of the study now being given to the effects of light in the tropics, Wolfe's amazing failure even to mention this factor, destroys much of the scientific value of his conclusions. Yet it is something to have the

<sup>1</sup> Amer. Jour. of the Med. Sciences, 1905.

<sup>2</sup> N. Y. Med. Rec., Feb. 2, 1907, p. 195.

<sup>1</sup> N. Y. Med. Record, Aug. 31, 1907.

neurasthenia acknowledged, for a few years ago its existence was officially denied, and an old army surgeon has more recently asserted that there is nothing wrong with tropical climates at all, army officers having acquired a fad of denouncing them. He mentioned the many thousands of sick passing through his hospital but did not explain this excessive amount of sickness.

**The factors of safety in animal structure and animal economy** were described by Dr. S. J. Meltzer,<sup>1</sup> of the Rockefeller Institute for Medical Research, in his Harvey Society Lecture at the New York Academy of Medicine, December 15, 1906. It is difficult to comment upon the vast importance of this subject without using language which appears extreme. It explains many matters of current discussion. Indeed, the whole subject of the management of health and disease would be profoundly modified if every physician and pedagog would take to heart what Meltzer has so ably set forth in this most interesting and instructive lecture. For the purposes of safety, engineers always design a machine several times stronger than necessary to stand the maximum strain to which it will be subjected. Some machines need be but twice as strong as the maximum load. In others it is necessary to use a factor of twenty, the machine being twenty times stronger than the calculated loads.

**Surplus strength** has long been known, in a general way. Nature constructs the organism so that it is more powerful than the usual strains, but Meltzer proves that the law of engineering really holds throughout, and that there is a factor of safety of six to ten or more in every organ and every function. It is natural law as well as hu-

man. It results from the law of selection. "Those species which are provided with an abundance of useful structure and energy and are prepared to meet many emergencies are best fitted to survive in the struggle for existence." Extra strength is a "reserve fund" without which physical bankruptcy and death constantly stare us in face. A neurasthenic has no factor of safety and is bowled over by strains which the normal resist. The normal eye has far more accommodation than needed, but when presbyopia or refractive errors like astigmatism and hyperopia reduce the factor of safety, there's trouble. In eyestrain there is no factor of safety.

**The factor of ignorance** also describes the factor of safety, for it is a provision against unknown strains or temporary accidental reductions of strength. A man must be able to put forth tremendous efforts now and then, otherwise he perishes. He must have a surplus everywhere, say, in breathing power, for if disease disables a part of a lung, he would otherwise suffocate. A boiler would explode every time a plate rusted or a bolt loosened, if it had no factor of safety.

**The dangers of athletic "training"** are now self-evident, for the "trained" man is using surplus energies designed for short emergencies. He works to the limit of his powers and reduces his factor of safety. His arteries are under a prolonged pressure which they cannot safely stand, though they are designed to bear it as an exceptional shortload. Consequently they thicken. The heart is overloaded, and it too enlarges, for Meltzer shows that nature's rule is to restore the factor of safety when possible. The nervous system is likewise overloaded and its "reserve fund" drawn upon, with subsequent neurasthenia, alcoholism and allied

<sup>1</sup> Science, March 29, 1907.

habits of the nervously exhausted. Arteriosclerosis, heart disease, neurasthenia, alcoholism, drug habits, increased susceptibility to tuberculosis and other infections—these are the results of imposing upon our factors of safety whether by muscular or mental strains. What a plea for the simple life!

**The mortality of college athletes** has been statistically investigated by Dr. Wm. G. Anderson, director of the Yale gymnasium, who finds that while death has claimed 12.9 percent of Yale graduates since 1855, yet only 7.2 percent of those who have "made" a team have died. He states that this lessened mortality might be due to the fact that the teams are composed of picked men, selected by reason of original strength and perfect condition. The "weaklings" do not attain the team. Nevertheless, Anderson's article implies that college athletics are not injurious, and it is most dangerous for that reason. These picked men should show a far less mortality—extra good insurance risks. Moreover, he fails to note that the worst dangers are the product of the methods grown up in the last 25 or 30 years. In 1855, and for a long time afterward, unnatural training was not so common, if it was permitted at all. Finally, the dangers are not immediately fatal, indeed the worst result—neurasthenia—seems actually to prolong life, for the sufferer ceases the strains, stops work, and gets far below his reduced factor of safety.

**The Reform of College Athletics.**—Statistics have rarely been put to a more unscientific use than by Dr. Anderson, for they imply the opposite of the truth. Modern college sports must be in a bad way to stoop to such a defense. A method is bad if it selects for unnatural strains a few of the best, for the delectation of a horde of

simply-faced, hollow-chested boys, whose ideal of physical training is to smoke cigars, drink beer, give the college yell, and root for the "beef" of the college. If a student is so well developed that he can "make a team," his further training is unnecessary. Nature can be trusted to continue the good work. The efforts of gymnasium "experts" should be directed to men unable to make a team. All the money spent in "training" for college contests is worse than wasted, for some of it does harm. Present methods produce the "mollycoddles" of the bleachers. Proper sport cures them. Professor Wilder, of Cornell, has wisely written against football and such "sports" of the few, and his words should awaken the universities to their duties to the mollycoddles caused by "sport."

**The decreasing need of a great musculature** is a point which our universities would do well to keep in mind. Primitive man domesticated certain animals for their muscular power, but modern man has long been inventing mechanical devices to supplement or replace his own feeble muscles. As civilization advances, the man of intelligence is becoming more of a brain worker, directing the power of machines and the labor of animals or the lower races. Consequently a great musculature is really a parasite requiring time and labor to keep it healthy and also an undue amount of nourishment. Such men are not necessarily the best—indeed many of them die much earlier than is supposed for they are physiological profligates. The digestive system is required to do much work unnecessary in men of lighter build and in the race of life the least burdened have the advantage. Boys are naturally proud of muscular development and can usually be depended upon to work it up themselves without the

unwholesome stimulation of a gymnasium designed for the defective. It does seem as though our college sports were developing muscles beyond all practical needs of educated men of intelligence.

**The dangers of great musculature** are now well known. Such men are constantly tempted to an exertion for which the heart and arteries are not fitted, so that cardiac hypertrophy and arteriosclerosis are the inevitable results. Savage man did not work hard as a rule; he hunted intermittently and lay idle be-times. The arteries can stand that kind of treatment, but not persistent high tension. Muscular workers do not live as long as the sedentary who are able to live normally. Of course tailoring and such trades are fatal from infections due to confinement, but the clergy, who can live in the open air or at least in good air, are long lived. Trades requiring great exertion, such as steel puddling, are very quickly fatal. Boys, then, need not be stimulated to develop a fatal degree of musculature; if anything, they need restraint.

**The advantages of a good physique** need not be mentioned. There have been many frail men of genius, but the successful and noted men of the world are generally the opposite. They are notoriously large framed and congenitally endowed with great reserve powers which they never call on. Their factors of safety are enormous, and they can survive blows which are fatal to the frail. They are not necessarily muscular, though many of them are; but they do not use their muscles any more than necessary. Indeed many of them have been noted for their dislike for exercise and have, therefore, never suffered from high arterial tension, and though lazy have

attained advanced age in health and comfort. Some of these factors of success are mental and congenital and no amount of "training" will create them. Though there can be no denial of the good accomplished by proper exercises for the defective, yet it should be recognized that the real development is during childhood, and is a matter of proper living as well as congenital endowment. Boys may, therefore, be taught that wholesome living will be of more benefit than piles of parasitic muscles. Physical culture is not muscle culture.

**The neglect of college faculties to control student athletics** is the alarming state of affairs brought out in the minority report of Moorfield Storey, appended to the majority report of the Harvard joint committee on the regulation of athletic sports (Feb. 27, 1907). It seems that time and again the faculty called attention to the harm done and recommended changes, even forbidding football and other intercollegiate abominations, but was repeatedly ignored. This is amazing, as fathers are under the impression that a college faculty acts in loco parentis. There seems to be a serious neglect of duty to guard the boys against their mistaken enthusiasms. To claim lack of power will not do, for every faculty can expel a student who defies them by playing any forbidden games—gambling or athletic. In view of the fact that the brutalizing exhibitions of beefiness are harmful and that the men who need developmental exercise do not get it on the bleachers, and the further medical fact that severe training in youth is extremely prejudicial to health and longevity, it is a severe condemnation of American college faculties that they have so neglected the boys who have been confided to their care. It is an axiom of the racing world, that a "Derby colt" is

ruined for life by overstraining while immature, and never does much afterward. The same law holds as to boys. Mr. Storey should receive the cordial support of the medical profession.

**The stupidity of college athletes** is a popular impression, because of the fact that great athletes are in the lime-light and their failures in studies attract undue attention. It has generally been said that athletics tends to diminish scholarship, whereas it is possible that great intellectual power may not be in the possession of the athlete. Sports may have had nothing to do with the matter. Whatever the cause may be, it is certainly a popular impression that scholarship and athletics are incompatible. This is confirmed by some remarkable statistics collected by Professor Foster of Bowdoin College. With few exceptions, the athletes show poorer results in studies than the nonathletes, considering the average of the two classes, though the differences are not nearly as great as generally assumed. He claims that college sports are not excessively injurious, though he seems to acknowledge they are somewhat harmful.

**College sports should benefit scholarship** and it is time to inquire why they are harmful even in the least degree. If they were regulated so that they would serve the purpose for which they exist, the statistics would be reversed. Sensible men will welcome the time when the class honors will be taken by those who are also excellent in sports. At present, a student who desires to excel in scholarship is compelled to shun the sports—and this is a hygienic blunder for which we may blame the college faculties. If it is true that the athlete tends to be less intelligent it cer-

tainly is a great blunder to allow him to set the pace, which the more mentally gifted cannot endure. No matter what the cause or the effect may be, there is something wrong to produce the figures published by Professor Foster.

**By Whom Shall Opsonic Bacterial Therapy be Practiced.**—Latent interest in the theory of opsonins and the practice of treating subacute and chronic infections by bacterial "vaccines" seems to have been actively aroused by the publication of certain recent reports presenting clinical experiences in the new field. In this country the paper by Ohlmacher<sup>1</sup> served to crystallize the attention of the profession, if one may judge by the usual indications of aroused interest in medical circles. Many queries have naturally arisen in the minds of those who have been impressed with the encouraging therapeutic results accruing from this method of artificial bacterial inoculation and who would extend to their patients the benefits of the new procedure as speedily as possible. Naturally the preeminent question is whether a given practitioner can himself successfully apply the opsonic method; and failing this, can the bacterial agents or so-called "vaccines" be obtained ready prepared for bedside use. It seems fair, with the weight of rapidly increasing evidence, to admit that Wright's opsonic therapy opens a new and vast field for the remedial use of bacterial inoculations, and there are humanitarian considerations which urge the extension of the new practice as speedily as possible.

**The Necessity for High Technical Skill.**—No one who has familiarized himself with the details incidental to the methods instituted by Wright and his associates can

<sup>1</sup> Science, July 6, 1906

<sup>1</sup> The Journal of the American Medical Association, February 16, 1907

overlook the complex and severely technical nature of the task, especially when this concerns the isolation and identification of the offending bacterium in an infectious condition of unknown etiology, and the prosecution of the further steps required in successfully treating the patient with the potent biologic agent represented in a properly prepared corresponding or autogenous vaccine. Equally evident must be the danger attending the indiscriminate or improper employment of methods so exacting, or remedies alike powerful for good or evil. One shudders to think of the risk underlying the use of "vaccines" with their bacteria unkilld, perhaps contaminated with other and more dangerous species, or as happened in the old days of humanized variolous inoculation, containing the virus of syphilis. Disrepute in the lay mind prejudicial or even fatal to the introduction of a new method of practice would speedily be engendered by these incautious efforts; and laying aside the matter of actual dangers, progress would be much impeded by a series of unsuccessful results in the hands of untrained practisers.

**A new type of practitioner, the immunizator,** may appear as a natural outcome such development in medical science. This belief was expressed by the originator of opsonic theory and the practice of therapeutic bacterial inoculation, in closing his Toronto address. This immunizator would say: "You are infected with a particular microbe and my business is to find out the microbe, make a vaccine from it and inoculate you and bring up the resisting power of your blood. For such skilled service you will require a man who has spent years of study to master the technic, to know how to make the vaccines, to know where to look for the microbes, to know which are the

most important microbes, to know how to isolate them, and most of all, a man with sufficient experience and ability to apply all these things." With these sentiments conservative American physicians will heartily accord, leaving to a new and for the present comparatively rare specialist, the "opsonist," the difficult and delicate task of accumulating material and simplifying the methods until a more general adoption is warranted. And until these specialists have more securely paved the way, the use of such bacterial vaccines as may be offered in commerce will be irrational or even hazardous.

**The life insurance scandals** are still with us, and will remain with us as long as there are huge sums of money seeking investments, and hordes of promoters fighting for it. The purpose of these reserve funds seems to be forgotten in the present wild scramble to control them. It begins to be suspected that the victors in the fight will consider themselves authorized to place funds in wild-cat propositions or in railroad bonds to extend lines of doubtful profit. The policy holders, being the ones vitally affected, should take greater interest in the matter, for they may regret their carelessness later.

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**Payment for Birth Certificates.**—Hereafter every baby born in Michigan will cost the county into which it has come 75 cents. A law passed by the Legislature last spring provides that all physicians, midwives, or nurses who file their birth certificates, properly made out in black ink, with the registrar within ten days after the birth, will receive a compensation of 50 cents for each certificate. In addition to the compensation for the physicians or others making out the certificates, the registrars receive 25 cents for their services in recording and forwarding the same to the department at Lansing.

## CORRESPONDENCE.

### PERSONAL VIEWS ON THE CAUSES OF SELF-MEDICATION, PATENT MEDICINE, CHRISTIAN SCIENCE AND OTHER EVILS.

BY

H. B. FORBES, M. D.,  
of Ogden, Utah.

*To the Editor of American Medicine:*—A great deal has been said and written of late on the above mentioned evils, which, without doubt, are serious and growing ones. Many explanations and solutions have been advanced, but in my judgment, the chief cause may be placed under two heads, *viz.*: 1. Faith in drugs, inspired by the medical profession and due, in part, to the previous ignorance of the public and the profession as well. 2. The relative impotency of these drugs. In a word, the laity has been taught to believe that most or all diseases are curable with drugs, while, in reality most diseases are not curable with drugs—our treatment is largely expectant and symptomatic. There is no denying that much that is now done, especially in the line of medication, is absolutely devoid of results.

The public, owing to its present state of ignorance of medical subjects, is unable to distinguish between different varieties or degrees of illness and hence considers a recovery under any of the irregular methods of treatment as evidence of the virtue of that treatment, while from a scientific standpoint, it may only indicate a recovery coincident with or even in spite of it.

Quite an important cause of these erroneous views so generally held by the laity is due either to, (1) professional assent to antiquated teachings, for fear of losing the patient's confidence in counteracting his views; or (2) absolute misrepresentation, which is more frequent in every-day practice than it is pleasing to relate.

For what else is the almost universal claim of members of the profession to ability to "break up" typhoid fever, etc; symptomatic treatment of acute infectious diseases, pretended as specific curative treatment, etc.

To a certain extent these evils are due to our own shortcomings. It is mainly in chronic cases that these evils prevail and yet, we must admit, the people consult us first. Would they desert us if we gave reasonable satisfaction?

Of course in a certain proportion of cases, as, in that yet too large class of diseases pronounced incurable by the medical profession, any method, even absurd ones, will often be

tried in hope of securing benefit. This percentage can be reduced somewhat, but probably cannot be entirely overcome, but even these, when the prognosis is correctly given, should, in the end, increase confidence in our profession and thus greatly redound to its advantage.

Some advantages of irregulars: There are even some advantages in the existence of these many methods of healing. Medicine has always been and should be conservative. It refuses, and should refuse, to accept or even make general trial of the many new and revolutionary ideas which appear from time to time. Many of the grandest discoveries in medicine, as in all other departments of learning, have been bitterly assailed, until time had finally allowed for unprejudiced thought. It is well, for human life is too precious to be jeopardized by a general trial of every fad that comes along. It remains for the few, who, seeing clearer and farther than the great mass, have the insight to know and the courage and ability to demonstrate the new truth. Then suddenly it all becomes clear and we marvel at our previous ignorance. I say these irregular schools and cults often unconsciously or accidentally teach us many things which the great medical body would be slow to investigate because of the great responsibility attending trial on a correspondingly large scale. I believe that in many of these methods there is a kernel of good along with the mass of error or fraud, and that they are often due to certain shortcomings of the medical profession or the imperfection, as yet, of medical knowledge, and that many of them are teaching us certain truths, just as homeopathy taught the profession of former years certain truths concerning nauseous drugs and complicated mixtures.

Whatever may be said of the medical profession, it fills a need and is here to stay. While there yet remains need of skilled advice—the result of the accumulated wisdom of 20 centuries of medical research—the profession must and shall remain to do its noble work. Remove it and we at once return to the mysticism and fetishism of the past, or a little later to the simple and ineffectual but consoling ministrations of our grandmothers.

In my opinion, what is needed is more frankness with the public, as Grover Cleveland recently advised. A gradual education of the public to a correct understanding of our present powers and limitations, both by individual expression and also by systematic lectures and weekly articles in the newspapers under the direction of committees of the various county

societies. Show them that great as are our limitations, yet equally great are our powers for good; that while Medicine may be but half science, the half is worth everything in the world to all of us. If drugs will be of no benefit, or if nothing will, say so and let the patient find out after costly trials, the wisdom of the advice.

Let us begin—we have nothing to fear and, in my opinion, there can be but one result and that an increased confidence in our efforts which, looking at them “in the large,” deserve it.

In conclusion, I submit as the real cause of these evils, public ignorance, fostered or allowed to exist by the medical profession; and the solution, “no secret remedies, no placebos” (Cabot); but, also, no more trade tricks (misrepresentation); and above all, a systematic education of the public, both to a correct knowledge of accepted facts and also of prevailing errors.

### THE THIRD PROFESSION.

BY

F. C. CLARK, M. D.,  
of Providence, R. I.

*To the Editor of American Medicine:*—I have just had my attention directed to the review of an humble effort of mine in the cause of medical science, which you were pleased to publish in your August number of *American Medicine*.

It is now some 30 years since I turned my thoughts toward this subject, when in my early days of enthusiasm I became a member of the faculty. I was even then struck with the blindness or apathy of the profession. No one beside myself seemed at all aware of the change which was making its appearance and so detrimental to the best interests of the profession.

Some time in 1886, it was my privilege to bring the subject up for consideration before the R. I. Medical Society, who very kindly agreed with my views, but did not seem, as the sequel proved, to know exactly what they had agreed to. However, I succeeded in showing the rising spirit of commercialism which was invading the profession—an insidious enemy seeking for every loophole in the camp. I had not then, nor do I have now, any objection to new remedies; but the manufacturing chemists, as they then began to term themselves, were assailing more and more, on every hand, the weak points of human medical, nature, to the detriment of legitimate methods of prescribing. These firms not only succeeded in persuading the physician to dispense with his ordinary use of drugs and

adopt theirs *in toto*, but advertised their wares largely in secular or lay periodicals and newspapers (till they had won over the medical journals) thereby gaining the ear of a suffering community looking for cheap “doctoring.” Often the equilibrium between the local druggist and the physician in this new basis had been reestablished, the druggist reaped larger profits than before, for the medicaments, which physicians now began to employ both in their offices and on their prescriptions, specified the diseases for which they were to be administered. The druggist naturally and in self-defense became a counter-prescriber, if not a manufacturing chemist himself. Humanly speaking he could not be blamed. If physicians gave these remedies merely on the strength of their labels, why not he? He did so; and the physicians have only to thank themselves for the practice. Their legitimate local trade had lamentably failed as far as their legitimate dealings in drugs were concerned, the only link remaining between the druggist and the physician being the old-time custom of discounting to the latter all sales, from a cigar down to a dose of castor-oil—a privilege the medical fraternity still insist on.

If physicians had agreed among themselves to prescribe no remedies whose nature and compatibilities were not understood, some simple remedy easily prescribed, put up and taken, instead of taking part in the mad race to be “up-to-date” even in the matter of prescribing, they might have retarded if not prevented the change now taking place in the medical world to their sorrow. But commercial greed was too strong apparently in most of them. Human nature could not more withstand the onsets of the smooth-talking advocate of the new-found panacea, than other inventions of the evil one. Instead of killing two birds with one stone, they almost ruined themselves.

For my part, from the first years of my entrance into the profession of medicine I never failed to perceive the mutual relations, the total interdependence of the druggist and physician. It is impossible to dissociate the two without loss. It was my habit to consult my druggist friends, when any new remedy made its appearance and attracted my attention; or, again, when I desired to combine certain remedies in most acceptable forms. Many useful hints and valuable suggestions have I thus received from these friends—which gave me no occasion to resort to “elegant” and attractive proprietary medicines. My relations with druggists are all that can be

desired, and I consider it a favor and not an effete custom when they discount my purchases.

Nor do I advocate polypharmacy. If two or three remedies combined are sufficient to meet the case in hand, why prescribe 10 or 20 different ones, the effect of which can never be satisfactorily determined? The greatest effects are often accomplished by the simplest means. I have no sympathy with those who are looking for *effect* rather than for *effects*. Must we still think it necessary to mystify the patient in order to win his confidence? If simplicity had been more honestly followed the relation between physician and druggist, in my opinion, would never have been broken.

## THE FEE FOR INSURANCE EXAMINATIONS.

July 2, 1906.

THE MANAGER

— INSURANCE CO.,

Sir:—I have the honor to acknowledge the receipt of your request to examine an army officer at this post as to his fitness for insurance in your company, and to reply that I have informed him that it is not to his pecuniary interest to insure in a company which takes inefficient means to exclude undesirable risks among civilians.

The fee (\$3.00) paid for an expert opinion as to whether or not you should contract to pay the estate \$3,000, in case of death, is too small to get reliable information. While I would be glad to help a brother officer without any pay for the service, I am too much alive to the injury you are doing to other policy holders in the army to be a party to such an arrangement. As a matter of principle, then, I always refuse to make such examinations for a fee less than  $\frac{1}{2}$  of 1 percent of the face value of the policy and a minimum fee of \$5.00 in any case, together with extra pay for any travel involved, extra examinations or exceptional time spent upon them. I am not seeking such work and am willing it should go to others, as I am busy enough with official duties, but I have carefully explained to this officer that the plan you have adopted endangers the value of his policy, for it increases his annual expenses by an amount sufficient to cover death losses of diseased applicants accepted as a result of careless examinations due to poor pay of the examiner. It has also been carefully explained to him that you can get this examination made for 25 or 50 cents, and the value received will be just what is paid or less, but that physicians competent enough to do the work are too busy

to spend valuable time on it for small pay. The work, therefore, must drift in time to the incompetent or those dishonorable enough to sign the papers without really making the required examination. In either case poor risks will be accepted, the expenses due to their deaths may jeopardize the company's stability in the future, and another scandal develop which will exceed past ones.

I reserve the right to publish this letter in the interests of other army officers who may desire to insure with you, in order that they may be fully informed as to the increased risks they run of future default of payment if this plan is continued. The interests of their families deserves careful consideration, as they have a stable mutual aid association of their own, which in time will write larger policies than at present and for far less cost than your company, with its enormous expenses in other directions but so lacking in business principles in its Medical Department as to expect something for nothing.

Thanking you for your courteous note, and expressing personal regards I am.

Yours very truly.

W—

NOTE.—Within 48 hours the manager found a physician not only willing but eager to make the examination, and he would have done the work for \$1.00 just as willingly. In other words the medical profession itself is standing in the way of stopping the new insurance scandal which in time is sure to reflect seriously upon us all.

W.

## TO ABOLISH EXAMINATIONS BEFORE STATE BOARDS.

To the Editor of *American Medicine*:—I have read with interest, editorials in the last two numbers of *American Medicine* upon the advisability of dropping therapeutics from State examinations. That is what was done in New York in the "Medical Unity Bill" signed by Governor Hughes on May 13, last. That bill abolished the three examining boards which before existed and established one board of nine members before whom all applicants must appear. Examinations are held upon the following subjects: Anatomy, physiology, chemistry, hygiene and sanitation, surgery, obstetrics, gynecology, pathology and bacteriology, diagnosis. The successful applicant receives a license to *practise medicine*. He may use any method of treatment his judgment dictates.

Yours very truly,

FLOYD M. CRANDALL.

## ORIGINAL ARTICLES.

### ACCESSORY PANCREAS, WITH REPORT OF TWO CASES.\*

BY

A. G. ELLIS, M.D.,

Associate in Pathology, Jefferson Medical College, Philadelphia.

This anomaly of the pancreas is not of common occurrence but, in recent years since more careful histologic studies are made of autopsy material, instances are being quite frequently added.

Warthin,<sup>1</sup> in 1904, collated 47 cases and added two. I have found references to 14 others reported before or since Warthin's paper was published. Gandy and Griffon,<sup>2</sup> in 1901, described a specimen found in the first part of the duodenum. Reitmann,<sup>3</sup> in 1903, reported two cases, one in the wall of the ileum 10 cm. from the ileocecal valve, the other in the duodeno-jejunal flexure. In 1904 Turner<sup>4</sup> described a nodule of pancreatic tissue situated in the jejunum 30 cm. from its origin. In the same year Drs. Müller and Alburger each presented a case before this society and in the discussion which followed, personal cases were cited by Drs. Robertson, Longcope and Stengel.<sup>5</sup>

Bize,<sup>6</sup> also in 1904, added two cases, each specimen being at the extremity of a diverticulum of the ileum, 25 and 60 cm. respectively from the ileocecal valve. He cites a case reported in 1899 by Brunner, the nodule being in a diverticulum 37 cm. above the valve. Bize also cites four cases, all in diverticula, reported in 1891 by Heller and Schmauser, but as his references are not clear and those cases are mentioned neither by Glinski nor Thorel I have not included them. In 1905 Lewis<sup>7</sup> found an accessory pancreas in the jejunum 85 cm. below the pylorus. Hedinger,<sup>8</sup> in 1906, described a specimen situated at the tip of a Meckel's diverticulum. To these cases I am enabled to add two, making a total of 65.

Naturally the larger number of these ectopic organs are found along the course of the gastrointestinal tract. Since in four instances two

specimens each were found, the 65 cases include 69 nodules of pancreatic tissue, located as follows:

Stomach 17, one in a diverticulum; duodenum 14; jejunum 21, one in a diverticulum; ileum 11, eight in diverticula; "intestine" 1; "Meckel's diverticulum" 1; umbilical fistula, 1; mesenteric fat, 1; omentum, 1; hilus of spleen 1.

The unusual situation of one of the specimens I present and the probable beginning malignancy of the other is considered justification for putting on record these two cases. Both were found within a period of three weeks.

**CASE I.**—This specimen was obtained at autopsy upon a male infant, a twin, 37 cm. long, which died two hours after premature birth due to placenta prævia. The findings were essentially those of a normal child. In the hilus of the spleen and firmly attached to that organ was a lobulated, yellowish body 5 mm. in diameter, supposedly a lymph node.

Microscopic sections passing through both spleen and nodule show the latter to be an accessory pancreas. Some of the acinar cells are in a fair state of preservation, others are degenerated. A few small interlobular ducts are present. At a few points are what appear to be indistinct centroacinar cells and there are also several circumscribed masses of small cells resembling islands of Langerhans. Fibrous tissue is not abundant but several bands divide the gland into distinct lobules. The nodule is attached to the spleen by a relatively broad band of loose connective tissue containing numerous large bloodvessels.

**CASE II.**—The second specimen was found 5 cm. from the pylorus in the posterior wall of the stomach of a colored man aged 86. It was in the shape of a solid, grayish, slightly elevated nodule, 1.5 cm. in length and 0.6 cm. in width. Microscopically the submucosa contains two small areas of pancreatic tissue quite widely separated and forming but a small part of the nodule. In both parts are ducts, with one exception small in size and possessing no demonstrable communication with the gastric mucosa. Many of the acinar cells are detached from the wall; most are granular, some are partially disintegrated. A few acini contain what are regarded as centroacinar cells. Islands of Langerhans are not present. Connective tissue is scanty in the large area but in the small are several broad bands dividing it into lobules.

Separating the two masses of pancreatic tissue, and at points extending beyond them, is a

\*Read before the Pathological Society of Philadelphia, March 14, 1907.

much larger area made up chiefly of tubules lined by tall cylindric epithelium. Thick bands of connective tissue divide this area into several fairly distinct lobules. In each the centrally situated tubules, appearing mainly in longitudinal section, are very greatly dilated to form irregular cyst-like spaces with numerous finger-like extensions. At several points the lining cells are supported by no demonstrable basement membrane and in a few instances appear quite clearly to be penetrating the surrounding connective tissue, though the latter nowhere is extensively invaded. Toward the periphery of these lobules the tubular epithelium shows degenerative changes and at outlying points but continuous with them are smaller, regular tubules or acini lined by cuboidal cells in advanced stages of degeneration. A few tubules lined by cylindric cells are at isolated, widely separated points in the muscle coat of the stomach.

From the general structure of this nodule it appears reasonable to infer that the central area is an adenomatous overgrowth of the ducts with extensive atrophy and degeneration of the pancreatic tissue. One of the specimens described by Bize contained a similar adenoma. Of the greatest importance in my case is the relation of the epithelium of this growth to the surrounding tissue, this as described justifying the diagnosis of potential, if not actual, carcinoma. Warthin considers the possibility of malignancy as the most important single point regarding the pathology of these islands of ectopic tissue. To this question my second case adds affirmative evidence not hitherto adduced and hence furnishes a distinct contribution to the pathology of accessory pancreas.

Of further interest in this case was the presence in the greater curvature of the stomach near the cardiac end of a second nodule 1 cm. in diameter which, on section, proves to be a fibromyoma occupying all of the muscle coat and a part of the submucosa. Muscle fibers are most conspicuous in the peripheral portions, the center being made up entirely of dense fibrous tissue. This nodule contains no sign of pancreatic tissue.

These accessory organs appear of little or no physiologic value. Their possibilities, when the normally situated pancreas is by disease rendered partially or entirely functionless, must,

however, be considered. From a pathologic standpoint their capabilities are more numerous though mainly remote. They undoubtedly favor diverticulum formation, Bize probably being correct in his assumption that all diverticula containing pancreatic tissue are produced by traction of that structure and hence are in no wise true Meckel's diverticula. Intestinal obstruction may be caused by these just it is by the ordinary Meckel's diverticulum and was so caused in Brunner's case and the second one of Bize. Intussusception, fistula, fat necrosis, and portal of entry of infection are other possible untoward effects, but in the great majority of cases the ectopic tissue has appeared to be entirely harmless.

The simplest and withal the most reasonable explanation of the origin of these misplaced fragments is that during development of the pancreas cell masses are separated from the organ and carried to variable distances by further growth of the tissues. This readily explains the accessory masses in the wall of the stomach and intestines, they having been carried upward or downward by longitudinal extension of the growing canal. For those in the omentum, mesentery, or region of the spleen this exact method cannot be active. Endres believes that detached fragments may be carried in the tissues to a distance by arterial growths, as along the course of the gastropiploic or pancreaticoduodenal vessels, in this way even lodging in the stomach wall. This would hardly account for the specimen attached to the spleen and we must conclude that, as in the case of the adrenal and other organs, there are various ways in which ectopic fragments are formed and placed.

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- <sup>4</sup> Lancet, p. 1566, December 3, 1904.
- <sup>5</sup> Proceedings Pathological Society of Philadelphia, pp. 226-229, September, 1904.
- <sup>6</sup> Rev. d'orthop., v, pp. 149-159, 1904.
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- <sup>8</sup> Corr.—Bl. f. Schweiz. Aerzte, Basel, xxxvi, 395, 1906.

## HEMATURIA OF VESICAL AND URETHRAL ORIGIN.<sup>1</sup>

BY

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of Philadelphia.

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Hospital.

Notwithstanding all that has been written and said on the subject of hematuria, the fact remains that it is a symptom, whether of bladder or renal origin, difficult of diagnosis to both specialist and practitioner, despite the modern methods which have unquestionably improved and facilitated the technic of diagnosis very much. There can be no doubt that the diagnosis of hematuria, and exhaustive papers on the subject are two different propositions. If the remarks I have to offer will be of any assistance for diagnostic purposes, I will have accomplished the object of my paper, for "he who diagnoses well, treats well." As my subject concerns the bladder and urethra, I will mention only a few of the commoner causes of hematuria, of bladder and urethral origin. It will simplify matters somewhat, if we classify hematuria under the heads of *initial*, *total*, and *terminal*: Blood which appears with the first jet of urine, will be considered *initial*; blood during the whole course of urination, *total*; blood at the close of urination, *terminal*.

I rather like Lydston's classification of the causes of hematuria as I consider it broad enough to cover the subject: "Congestion, inflammation, varicose veins, vesical calculus, villous tumors, traumatism, simple or malignant ulceration, rupture of the bladder, pathologic or traumatic, passive congestion of the prostate and bladder from hepatic obstruction, congestion of the prostatic plexus, straining at stool incident to inflamed hemorrhoids, urethral trauma, simple or specific urethritis, and organic stricture."

In a word, the bleeding may be mechanical, inflammatory, congestive, or organic. Generally when urination causes bleeding, stone, tumor, cystitis, or tuberculosis may be sus-

pected; cystitis, however, rarely develops except as a complication to some other condition.

Hemorrhage from the bladder or kidney is distinguished from hemorrhage due to urethral or prostatic sources, by the fact that the blood is uniformly mixed with the urine, while hemorrhage from the prostatic portion of the urethra and neck of the bladder, is characterized by the blood manifesting itself at the end of micturition. It may not seem out of place in this connection, if I mention the case of an old colored man whom I treated a short time ago, who suffered from persistent total hematuria, consequent to a diseased prostate. His prostate was enormously swollen from a specific urethritis, chronic in character. He finally recovered, but unfortunately the bladder was not examined cystoscopically.

Lydston also states that passive congestion of the prostate is a more frequent cause of hematuria than has been supposed, and says that he has seen hematuria in several cases of that character. The spermatic fluid in sexual intercourse is likely to be bloody when the blood comes from the prostate with or without involvement of the seminal vesicles. Bloody pollutions are symptomatic of acute vesiculitis in the great majority of cases.

Blood from the neck of the bladder can be detected by squeezing the prostate and vesical neck, when the last drops of urine are voided. If blood is passed copiously and persists after a blow on the bladder or some external injury, it indicates extraperitoneal rupture; if the blood is scanty, intraperitoneal rupture. Urethral bleeding in the vast majority of cases is due to unskilful instrumentation; a constant oozing is the common symptom and it is easily controlled by placing the fingers along the course of the urethra, or by the injection of adrenalin solution 1:1000.

I have known quite severe urethral hemorrhage to occur during sexual intercourse, when the patient suffered from a granular stricture with possible coexistent ulceration from the coarctation.

Sometimes the passage of a sound in a urethra studded with papilloma will cause consid-

<sup>1</sup>Read before the South Branch County Medical Society, November 30, 1906.

erable hemorrhage difficult to control. Fortunately urethral papillomas are not of very frequent occurrence.

Another cause of hematuria is small concretions, generally phosphatic, situated in the deep urethra. Not infrequently instrumentation in a urethra the seat of a granular stricture, may be followed by moderate hemorrhage.

In acute posterior urethritis the meatus is often bloodstained, especially when the last few drops are accompanied by tenesmus.

Hematuria from turpentine or cantharidis is mostly, if not entirely of vesical origin, as has been proved by experiments on dogs.

Stone in the urinary bladder rarely causes profuse bleeding; the blood here is intimately mixed with urine, which also contains mucous, pus, and crystals as a rule. The hemorrhage is aggravated by exercise and allayed by rest, while oftentimes the blood is more profuse at the close of urination; as a general rule, these facts backed up by the stone searcher or the cystoscope render a confirmatory diagnosis. The late Professor Ashhurst used to say the larger the stone the less the pain, which in the main is correct, but I think an exception to this rule might be made in regard to the mulberry calculus (calcium oxalate) a form which is not nearly so frequent as the uric acid and phosphatic calculus.

In this connection it may be of interest to cite the case of a patient of mine who complained of frequency of urination, the urine being tinged with blood. There was no history of gonorrhea. Examination revealed the prostate gland swollen and tender, but the examination of the bladder for calculus resulted negatively. My treatment gave no relief. However, the patient informed me later, that one evening while urinating in the yard he felt a sudden pain along the course of the urethra and that a hard substance passed from the urethra and struck the fence, and that this was the end of his trouble. This case would indicate that the stone may be so small as to be exceedingly difficult to detect.

It is well to bear in mind that a stone in the bladder may be partially encysted. In the few cases of stone in the prostate which I have

seen I did not observe hematuria as a clinical factor, although it has been observed and reported.

Hematuria is frequently the first symptom noticed by sufferers from stone; it generally occasions great alarm, and induces the patient to seek medical aid. A discharge of florid blood with the last few drops of urine is very significant of stone. When this occurs the hemorrhage arises from the stone having been brought into closer contact than before with the walls of the bladder, and it is especially likely to occur when the mucous membrane is inflamed or when the stone has a rough surface. The smooth concretions of uric acid seldom give rise to much hemorrhage which, on the other hand, is common when the stone is composed of calcium oxalate or studded on the surface with points of triple phosphatic crystals. Often there may be a stone in the bladder under a projecting lobe of the prostate, which the stone searcher will fail to detect, but the retrograde cystoscope will succeed in locating it.

Bransford Lewis says there is never a stone in the bladder but hematuria is a symptom, although the microscope may have to be employed in some cases to find the blood-corpuscles.

Always suspect stone when the characteristic stream of urine is suddenly interrupted. The stone may occlude the vesical outlet producing a suppression of urine, however, a change of posture often displaces the stone temporarily ameliorating the condition.

Fenwick says, tumors of the bladder, in 84 percent of cases make known their presence by hematuria, which is usually terminal in character and unaccompanied by other symptoms, unless the case is advanced, when cystitis becomes a complication. He also states that if the growth is near the vesical orifice, frequent urination may precede the appearance of blood. Among 140 cases of bladder tumors collected by Albarran, the first symptom was hematuria.

According to Douglas, symptomless hemorrhage in the vast majority of cases is characteristic of vesical tumors.

It is noteworthy that tumors of the bladder generally occur at the base, in the region of the trigonum.

The most common tumors of the bladder are papillomas or villous growths. In most of these cases there is sometimes more, and sometimes less bleeding and the patient lives for years, but sooner or later, carcinomatous degeneration occurs. Bladder tumors occur more frequently in the male than in the female. Nason states that out of 99 cases, 78 occurred in men. The diagnosis can best be made by the use of the cystoscope during the intervals of hemorrhage.

A diagnosis as to malignancy or nonmalignancy cannot be made from the amount of hemorrhage which occurs from a bladder tumor. Casper states that in his experience a tumor that bleeds nearly always is malignant, still he has seen a simple polypi bleed more profusely than a carcinomatous growth. Pain may or may not be present in bladder tumors.

In certain countries, hematuria is caused by the presence of a parasite in the bladder. An affection of this nature is endemic in Egypt, Maratius, the Brazils and some parts of southern Africa. The parasite is known as *Bilharzia hematobia* and was discovered by Dr. Bilharzin in 1851. The sediment of the urine contains blood, pus corpuscles mixed with coagula and shreds of tissue in which may be found the ova and free embryos of the parasite. Claude A. Smith<sup>1</sup> reports 7 cases among the Boers and South African negroes at the World's Fair in St. Louis. Dr. G. L. Crimp<sup>2</sup> gives the latest and best description of this malady now known as bilharziasis.

In urinary or genital tuberculosis hematuria is the rule, it is more frequently terminal than total and is accompanied by tenesmus and pyuria. Whether the malady originates in the kidney, epididymis, seminal vesicles or prostate gland, does not matter, as the bladder sooner or later becomes involved. Some one has well said and I wish to emphasize it, that a trained clinician is more apt to diagnose a vesical tuberculosis

correctly by clinical methods than the scientist by scientific methods. Kummell says every cystitis not due to the gonococcus or infection from without should be held suspicious of tuberculosis and be subject to careful observation. Unlike the hemorrhage due to stone it is not influenced by exercise, muscular activity, or shock to the body. The urine is acid, but may be alkaline in advanced cases due to the presence of certain bacteria.

Keyes' description is so lucid of tuberculous hematuria that it may be considered a classic. He states that hematuria is a prominent symptom first and last and that it is only in exceptional cases we have free hemorrhage, such as we find in neoplasms. The first bleeding noticed by the patient is often the exudation of a few drops of pure blood at the end of the urinary act. The blood is squeezed as it were from the base and neck of the bladder by its own contraction. This terminal hematuria is usually accompanied by pain and spasm which is very suggestive of tuberculosis. The hemorrhage is never profuse enough to fill the bladder with clots. It is sometimes better, and sometimes worse but constantly recurs. As the lesion spreads the hemorrhage becomes if anything less profuse and more continuous, the urine becomes hazy and contains a few small, bright red clots. The last few drops may be pure blood, beyond this there is not likely to be any severe bleeding, unless it is caused by the introduction of instruments into the bladder.

Hemophilia may be a cause of hematuria from instrumentation in an individual of that tendency even though the injury be slight.

In this connection I would call attention to the fact that males are much more apt to be bleeders than females. Hemophilia may be hereditary, from father to son and yet the mother may show no signs of this curious malady. It has been observed that the blood clots the same as any other blood when exposed to the air.

So far as I am aware the cause of hemophilia is unknown. The absence of certain salts or deficiency of fibrin in the blood is said by some

<sup>1</sup> *American Medicine*, October 14, 1905.

<sup>2</sup> *London Lancet*, March 9, 1906.

to be the cause. The bleeding is of the nature of a capillary oozing.

In conclusion, I desire to cite the method first advocated by Sir Henry Thompson, the first man to put the study of genitourinary maladies on a scientific basis.

Thompson's method for determining whether the blood comes from the kidney or not is to introduce a soft catheter gently just within the bladder neck, draw off the urine, and wash out the cavity very gently with tepid water. If the water cannot be made to flow away clear, the inference is that the blood comes from the cavity of the bladder.

If the water can be made to flow away clear, the catheter is corked for a few moments, the patient being at rest, and the first small quantity of urine which collects drawn off and examined. If this quantity of urine is bloody, and if after again washing the bladder the water comes away clear, the inference is that the blood is from the kidneys.

### INTRAUTERINE FRACTURE OF THE TIBIA.<sup>1</sup>

BY

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Among the more important and not at all infrequent pathologic conditions seen in the newborn, are those of congenital fractures. It is of interest to note that of all reported cases of fracture in utero, 50 percent have been fractures of the leg, and of this percentage less than 150 cases are recorded as having been fractures or deficiencies of the fibula while the tibia has been affected in a very much larger number of cases. I regret deeply that I have not obtained statistics as to the exact percentage of intrauterine fractures, but when we consider that about  $\frac{1}{2}$  percent of all infants present some deformity it is fair to conclude that anomalous tibias must be comparatively infrequent and, therefore, reports of the same are worthy of being placed among the archives of abnormalities.

Codivilla, in a most instructive article, speaks of these fractures as congenital pseudoarthrosis, this term, while no doubt perfectly legitimate,

is rather confusing since it includes angular deformities with and without mobility. His nomenclature, I should consider excellent where movement of either or both fragments exists, but, on the other hand where union has taken place or immobility is the rule, the use of the old term fracture would seem better. The pathology of these two varieties differs, in that, in the former, we have no doubt a greater deficiency of the osteoblastic power and in turn only a fibrous or cartilaginous union, in the latter union osteogenesis is probably nearer normal and a bony union results. We never speak of fractures with bony union, in the adult, as pseudoarthroses, and, therefore, I see no reason for applying this term to fractures in utero where union is osseous. The history of the two cases which I am about to describe, so far as can be ascertained, at no time presented mobility of fragments, and, as we know, in these cases, the prognosis is usually better.

Through the courtesy of Dr. E. R. Steele, I report the first case:

CASE I.—S. T. C., male, aged seven weeks, has so far as can be ascertained, a negative family history, in reference to deformities and nervous diseases. The father and mother are and always have been healthy and robust. He is the first child and was delivered spontaneously in good condition with the exception of the deformity. There is no evidence of rickets or syphilitic infection. The mother denies any history of external violence, peculiar disturbances, shock, or impressions of any kind but insists that her pregnancy was normal and undisturbed. The deformity was first noted by the physician who arrived an hour after the accouchement and who at once thought the condition was the result of delivery. After a more careful investigation, however, his conclusions were changed.

At first glance the foot appeared to be in a position of calcaneo-valgus, but on closer examination it was found that the tibia was at fault. There was an angular deformity in the lower one-fourth of the bone at an angle of about 95°, while the fibula seemed only to be bent upon itself. There was a very slight dimpling of the skin at the apex of the angle and the external malleolus was entirely obliterated though present on palpation. The leg obviously was about three-fourths of an inch

<sup>1</sup> Read before the Philadelphia Pediatric Society, March 12, 1907.

shorter than its fellow. On palpation no thickening was revealed or anything that seemed like callus about the seat of fracture but the tibia in its entirety was thinner than that of the unaffected leg. The toes and tarsus were apparently normal.

Under anesthesia, manual osteoclasis was performed by Dr. H. Augustus Wilson at St. Agnes Hospital, the fragments placed in a corrected position and a plaster-of-Paris retentive dressing applied. The tendons were not unduly tense and therefore tenotomy was uncalled for at this time. Four weeks later the cast was removed and union seemed perfect with a slight thickening at the point of fracture while the position of the leg was perfect.

The muscular action was not retarded.

The second case I did not have under my personal observation but report it by permission of Dr. H. Augustus Wilson, who thoroughly examined and treated the patient. The following notes are taken from the hospital record.

CASE II.—F. O. E., male, aged 4. Parents are living and well. Two brothers and two sisters are healthy, none presenting any abnormalities. The history in regard to tuberculosis, specific disease, and deformities is negative. He has not had the ordinary diseases of childhood but has always had good health excepting for his deformity. The left leg has been deformed since birth, there having been an intrauterine fracture of the tibia at the junction of the middle and lower third. When the patient was nine months old (there had evidently been no other treatment up to this time) a brace was applied which he wore for almost a year. It was then laid aside because it was apparently doing no good. When about two years of age he was operated upon at a general hospital in this city, an osteotomy was supposed to have been performed. After removal of the cast he soon began walking but the deformity recurred. The brace was used for two months but with no avail and again discarded. In December, 1898, he was admitted to the Jefferson Hospital. He was then a well-nourished child who walked with a limp on the left side. The tibia now bowed anteriorly at a sharp angle. At the angle of deformity was felt a thickness which was probably callus. The radiographs showed a united fracture of the tibia with a large amount of callus. The fibula was slightly bent in its lower third. A cuneiform osteotomy was performed at the

point of fracture and the fragments straightened and kept in position by silver wire, after which a plaster cast was applied. About three months later the silver wire was removed on account of a slight sinus which persisted, as a result of irritation; after this the wound healed within a week. A report from this case several weeks ago finds the patient in good health, with a fairly good limb, with slight shortening. This is nine years after the last operation. In this case the history of the mother's gravidity was not obtained and, therefore, we cannot consider the causation.

In studying the etiology of these and other malformations, we find we are dealing with a subject in which theorizing has been a noted factor and as a result find statements which are not based upon scientific facts.

According to the investigations of Ballantyne, and probably the most accepted theories which would apply to fractures in utero, would be that of mechanical disturbance and diseases of the fetus and fetal appendage. Chance and Sterling believe that from a series of these cases we can refer them as occurring during the first few months of embryonic life, meaning that they have no relation to trauma or violence. Hamilton records a number of cases of intrauterine fractures which are attributed to external violence, and two cases to uterine muscular contraction in which a distinct snap was heard at the time the break occurred which was rather late in pregnancy. In a consideration of Hamilton's cases, however, it must be borne in mind that at the time of their report, the accepted theory was probably that of external violence and uterine contractions as the predisposing cause. A plausible and more scientific theory is that of disease of the amnion which may be secondary to trauma, tumors, etc., in which adhesions develop and fibrous bands constrict the extremity, thereby limiting the circulation and causing deformity. Hoffa takes this view and believes that most cases are favored by disease of the amnion.

It is also claimed that rickets and syphilis or any condition causing imperfect osteogenesis predispose to these fractures.

The arrestive development theory or that of

congenital deficiency are only terms which might be applied to existing conditions and while having some basis would cause no end of discussion.

We must forget that oligemia and polyhydramnios, while by some considered as causes, are abnormal conditions in themselves and probably only accompaniments rather than causes.

The theories of heredity, mental emotion, and nervous conditions cannot be denied as possible factors since the literature of the subject shows instances where the relation of the cause and effect are seemingly clear.

In the first case, after a thorough examination of the mother as to her condition before, during, and after gravidity the only sound statement that could be made as to the etiology was, "I don't know."

These cases when seen early can often be corrected, according to Hoffa, by manual procedure after a retentive dressing is applied for some time. Walking on the affected limb should be restricted but passive motion, manipulation, muscular development, and internal medication should be the aim for a considerable length of time.

When seen later in life these cases must be treated by open operation, usually such as osteotomy and secondary wiring.

Codivilla reports one case in which he operated after Allier's method and did a periosteal transplantation, obtaining a good result. This case was a true pseudoarthrosis, when seen by him, but osteotomy had been performed some time before.

The prognosis in these cases is not as favorable as one might expect and in nearly all the cases, recurrence has taken place at one time or another. The danger of recurrence, however, is less after the tenth or twelfth year than it is before this time. Hoffa states that the limb always is shorter than that of the unaffected side even after operation. The slow growth of the affected leg with its osteoblastic deficiency and the normal growth of the other leg probably account for the distinct amount of shortening.

## TERMINAL DISINFECTION<sup>1</sup>

BY

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In presenting this subject for consideration, it is my desire to state certain features pertaining to the problem of terminal disinfection as experienced by the Department of Health of the city of Buffalo.

By terminal disinfection is meant the rendering inert of any material connected with a contagious disease in a household, after recovery or death from the illness.

July 1, 1904, the Department of Health in Buffalo undertook the terminal disinfection in all instances in which tuberculosis, scarlet fever, or diphtheria had existed, and with the instances of diphtheria and scarlet fever, it has been possible to trace fairly accurately by the records, what result, if any, has been gained by the methods employed toward lessening the amount of these diseases in the city. An effort has also been made to ascertain to what extent there has been a recurrence of the same class of disease in the household with a view of determining if the number of instances were greater before the municipal system disinfection was introduced.

Any one familiar with hygienic work recognizes that the amount of contagious disease in a locality will vary from year to year, even though there be no change in hygienic management, but it is usually anticipated if an additional precautionary measure is introduced, like the routine systematic municipal disinfection of all households in which diphtheria and scarlet fever have occurred, that there would be a diminution in the number of these cases, if the methods employed were efficient and if their application were sufficiently carried out.

Astonishing to relate there does not seem to have been a diminution in the amount of diphtheria and scarlet fever or in the number of

<sup>1</sup> Read before a meeting of the Medical Union at the University Club, Buffalo, upon the occasion of being entertained by Dr. Ernest Wende, Health Commissioner, Buffalo, Nov. 28, 1906.

recurrent cases that have occurred in the city of Buffalo since July 1, 1904.

During the two years preceding any effort upon the part of the municipal authorities to disinfect, there occurred 555 and 903 cases of diphtheria and 409 and 603 cases of scarlet fever. During the two years that terminal disinfection has been practised there have been 830 and 342 cases of diphtheria and 500 and 475 cases of scarlet fever. It can be readily seen by these figures that in one of the two years before municipal disinfection was inaugurated there were 300 cases less of diphtheria than in one of the years municipal disinfection has been practised. As regards the number of recurrent cases in the same household during the past year, there have been eight instances in which diphtheria has recurred in the same house within eight weeks after disinfection and 13 instances in which scarlet fever has recurred. With the diphtheria the majority of the instances of recurrence took place within a few days after recovery was established in the first case.

The questions now arise, is there anything at fault, and if so can it be corrected? For instance, is the method used in disinfection inefficient? Is the method not sufficiently carried out? Are there elements that may remain infected even if the system employed is efficient and thoroughly conducted? Are mild carrier cases responsible for the lack of apparent results and is the household disinfection of little value?

As regards the method employed I furnish the following statement from Mr. Charles Palmer, of the disinfecting staff.

In fumigating a house after contagious disease, we do not follow any set rule, as the conditions of the premises, in almost every instance, are invariably different. First, we ascertain the part of the premises where the patient has been during illness. Second, if the patient was waited upon by some member of the family or by a trained nurse, and if the attendant was isolated with the patient. Third, if all meals were brought to the door of the sickroom, and if the dishes were sterilized before leaving the room or kept for the exclusive use of the patient. If the patient has been cared for by a member of the family who has not been isolated in the sickroom, all persons are moved into the kitchen

or dining room and the remainder of the house or apartment is fumigated.

If the attendant has been isolated with the patient, after the patient and attendant have had an antiseptic bath and a change of clothing, they are confined to another room, and the sick-rooms are alone fumigated.

Before fumigating, the rooms are made as airtight as possible by pasting a paper strip over all broken glass, the cracks at the top and sides of sash being pasted or wedged; all bedding is placed over chair backs, bedrails, doors, etc., so that every part of it is exposed to the action of the gas; magazines and books are set up on end with covers opened; bureau and commode drawers opened, closet doors opened, pipe dampers and front drafts of stoves closed, open fireplaces and natural gas grate flues sealed. The room is measured and six ounces of formaldehyd is used to every 1,000 cubic feet of air space. In a room containing 1,512 cubic feet, two machines, or 12 ounces of formaldehyd, are used. The heating machines are set in plates or shallow dishes containing water, to prevent fire. The machines are watched until we are sure they are fully started, or until the formaldehyd has reached the boiling point. The exit door is sealed on the outside, and instructions given to the person in charge of the premises to open all doors and windows at the expiration of five hours.

The sign is then removed, and we proceed to the next case. The same process is used in both scarlet fever and diphtheria.

I wish to direct attention to that portion of the statement of Mr. Palmer, that after the machines are started and the rooms closed, the disinfectors leave the premises. By this, it can be understood that there is no way of positively ascertaining how long the rooms actually remain closed; but, owing to the fact that there are but two men doing this work in the city, it seems impossible, so far as this part is concerned, to inaugurate any other system.

Before this method was inaugurated an exhaustive series of tests were conducted as follows:

Pieces of sterilized cheesecloth were infected with different disease-producing organisms and exposed in the rooms at the time of the generation of the gas. The infected test cloths were placed at different elevations, from near the floor to the ceiling and at varying distances from the generators. No effort was made to close the

rooms more tightly than the shutting in the ordinary manner of all the doors and windows.

The test cloths thus exposed were universally found to be sterilized by the process given by Mr. Palmer, whereas infected test rags not thus exposed would give abundant evidence of the existing infection. From this it would appear that the method, so far as it pertains to the form of generation of the formaldehyd, is efficient.

As to whether the method has been thoroughly enough carried out and has extended so as to include a sufficient number of rooms in a household I am unable to state. Some members of the department staff express, as their opinion, that each and every room of a household should be subjected to the influences of the gas, if practical results are to be expected. It seems, that the general custom has been to leave it largely to the one doing the disinfection as to how many rooms should be included, and in most instances, where circumstances would permit, the members of the household would be confined to the kitchen, while the remainder of the house was fumigated. The argument in favor of including even the kitchen in this process of fumigation is that in the majority of residences where the contagious diseases mentioned have occurred, some member of the household is obliged to visit the kitchen who would run chances of coming in contact with the infection.

As to other elements that may remain infected even if the system employed is thoroughly and efficiently carried out, there is one point that seems worthy of consideration particularly in households where diphtheria has occurred. It is a known fact that the throat secretions of well persons not infrequently contain virulent diphtheria bacilli. It has been estimated by Park, of New York, that at least 2 percent of persons that have been in attendance upon diphtheria cases have the bacilli in their throat secretions. If this is true it can be readily understood that many an exposed member of a household carries the infection and insofar as any method is now in vogue in the quarantine regulations of Buffalo, no effort is made to prevent the spreading of the infection or the recurrence of the disease in the household, from

this source. The statistical records that I have related rather tend to show that, at least, part of the instances of the recurrence of diphtheria in the same household could be accounted for in this manner.

As to the part that mild or carrier cases may play in the transmission of cases of contagious disease I wish to quote from a portion of the summary of a very interesting paper read by Dr. C. V. Chapin, of Providence, before the Section on Hygiene and Sanitary Science of the American Medical Association.

Dr. Chapin gives as his opinion:

1. There is very little bacteriologic evidence that things remain long infected, and, therefore, contact between noninfected persons and infected thing, must be very direct and very close in point of time, if the things are to transmit infection.
2. The true explanation of the spread of contagion is the great number of unrecognized atypic and carrier cases.
3. Infected persons and not infected things are to be feared.
4. Official disinfection, as a final precautionary measure, has little value in preventing the spread of the common contagions.

Dr. Chapin's views will no doubt meet with severe opposition but there are certain features that would seem worthy of being brought to attention.

Some years ago I conducted an investigation to ascertain, if possible, to what extent the rooms in a contagious ward in a hospital housing diphtheria would become infected with Klebs-Löffler bacilli. Swabbings were made from the base boards, the iron portions of the beds, the floors and walls, and cultures made. In not a single instance was it possible to find Klebs-Löffler bacilli. This investigation covered a period of several weeks and was most thorough. Similar results have been obtained in the investigations of Hill, at the Massachusetts General Hospital, and the health authorities of Providence where the rooms in private residences were examined.

It would seem, from these results, that so far as room contamination is concerned in diphtheria, aside from the articles of clothing that come in immediate contact with the patient and

the utensils used in giving food and medication, there is little danger of household contamination, in this disease. As the true causal factor in scarlet fever is not known, it is impossible to state, with any degree of accuracy, how far room or household contamination may take place. It appears to be the consensus of opinion, however, that the chief factor in transmitting infection resides in the desquamating skin. If this is so, it would appear that more complete and more widely extended disinfection is required in the terminal disinfection following scarlet fever than in the terminal disinfection after diphtheria.

The following questions might now be asked: Is the failure to decrease the amount of diphtheria and scarlet fever in the city of Buffalo due: (1) To any inefficiency in methods of disinfection? (2) To the method not being sufficiently carried out? (3) To the influence that infected throat secretions may play in transmitting and causing a recurrence of the disease (diphtheria)? (4) To the mild, atypic and carrier case, or must it be recognized that there is foundation for the statements of Dr. Chapin?

The method of fumigation used in the Department of Health was subjected to a most severe series of tests at the time of its adoption, and insofar as the generation of formaldehyd in room disinfection is concerned, it is my belief that the method compares favorably with any in general use. As regards the method not being sufficiently carried out, it would seem, from the result of the investigations related, that there is little need of more thorough room disinfection in diphtheria than of the quarters formerly occupied as the sickroom, if all bedding, utensils, clothing, etc., are washed by a boiling process, except where conditions are apt to arise as will be stated later (see \*).

In scarlet fever and other diseases of this character, such as measles, chickenpox and smallpox, it would appear that each and every room in the household should be subjected to the effects of the gas.

In my experiments with the use of formaldehyd gas in household disinfection, the following is a record of the tests:

SERIES "A."

A fluid culture of *Bacillus prodigiosus* was mixed with pulverized sugar and allowed to dry. The mixture was again pulverized and dusted on the surface of the materials mentioned in such a manner that gentle shaking would easily cause its removal without actually touching the surfaces. After being exposed for 12 hours in a room containing 2,100 cubic feet, the results were as follows: (a) Dusted on plaster having smooth finish *B. prodigiosus* destroyed. (b) Dusted on plaster having rough finish *B. prodigiosus* destroyed. (c) Dusted on ordinary wallpaper *B. prodigiosus* destroyed. (d) Dusted on painted wood surface *B. prodigiosus* destroyed.

This series of tests would appear to establish, without question of doubt, the efficiency of the gas as a mere surface disinfectant.

The known infected materials occupied the same position as do the walls of a dust-laden apartment.

All "control cultures" grew.

SERIES "B."

The surface of the plaster having the smooth finish, plaster having rough finish, wallpaper and painted wood which were used in the tests of Series "A" were slightly touched with sterilized platinum wires and sterilized cotton swabs, and inoculations made into nutrient gelatin, nutrient agar and bouillon, resulting in bacterial growths in all media, with the exception of those inoculated from the paint. The growths present were *not Bacillus prodigiosus*.

All test objects were kept under glass covers on completion of the exposure to formaldehyd, thereby preventing possible contamination from outside sources.

SERIES "C."

Cultures of organisms named dried on surface of materials named and exposed six hours:

	Cholera Culture.	Typhoid Culture.	Diphtheria Culture.	Diphtheria Memb.	<i>B. icterogenes</i> Culture.	<i>B. pestis</i> Culture.	Tuberculous Sputum.
Metal plates . . . .	o	x	x	x	✓	o	x
Glass . . . . .	o	x	x	x	✓	o	x
Filter paper . . . .	o	o	o	o	o	o	✓
Glazed cardboard	o	x	o	o	o	o	x
Cheesecloth . . . .	o	o	o	o	o	o	o
Cotton batting . . .	o	o	o	o	o	o	x
Flannel . . . . .	o	o	o	o	o	o	o
Cotton cloth . . . .	o	o	o	o	o	o	o

Materials impregnated with fluid cultures, and moist during time of exposure:

	Cholera Culture.	Typhoid Culture.	Diphtheria Culture.	<i>B. tetragenos</i> Culture.	Tuberculous Sputum.	<i>B. pestis</i> Culture.
Metal plates .....	o	o	x	o	x	o
Glass .....	o	o	x	o	x	o
Filter paper .....	o	o	o	o	o	o
Glazed cardboard..	o	o	o	o	o	o
Cheesecloth. ....	o	o	o	o	o	o
Cotton batting ....	o	o	o	o	o	o
Flannel .....	o	o	o	o	o	o
Woolen yarn .....	o	o	o	o	o	o

By this procedure, the test objects remain moist the majority of the time during the exposure, which appears to demonstrate that the presence of moisture increases the destructive properties.

\*Certain facts are to be remembered in the application of formaldehyd gas in household disinfection. While diffusing with great readiness, its powers of penetration are but slight. This is shown by the facility with which the test objects were destroyed in Series "A" and when distributed on porous fabrics, and yet retained the ability to grow in cultures (see Series "B" and "C") when spread upon surfaces like glass, metal and glazed cardboard. This seems to demonstrate that, to disinfect thoroughly a room and its contents, we should not depend solely upon formaldehyd gas but that, in rooms having glazed surfaces, and in infections in which it is possible that the infectious material, such as blood, sputum, pus, feces or urine, may be dried upon the floors, vessels, basins, washstands, metal bedsteads and other hard substances, it should be supplemented by a solvent disinfectant process.

While, in formaldehyd gas, we seem to possess an efficient and harmless disinfectant for such objects as curtains, draperies, and the like, which before its introduction no equally satisfactory household method of disinfection was known, it appears that, in order to obtain results, individual judgment must be used in its application. One could briefly summarize as follows:

1. It is the most satisfactory gaseous disinfectant for household use.

2. Its penetrating powers are slight.
3. Moisture facilitates its gaseous action.
4. It must not alone be relied upon in the disinfection of a household.

As to the influence infected throat secretions may have in transmitting and causing a recurrence of diphtheria, it has, in my opinion, been conclusively proved that, in this disease, the presence of *virulent diphtheria bacilli in the throats of healthy individuals represents the greatest source of danger.*

The Department of Health of Buffalo requires that the attending physician shall make cultures from the throat secretions of persons that have been ill of diphtheria and that one negative result shall be obtained before municipal disinfection. This method has, in itself, three serious defects:

1. It has been shown, by abundant experience in this city and elsewhere, that one negative culture, even if properly made, does not insure against a possible existence of a remaining infection. Some cities require at least two or three negative results before quarantine is removed.

2. No attention is paid to the taking of cultures from the nose secretions as a routine measure in faucial diphtheria.

3. The most serious of all, that owing to the fact that the attending physician is allowed to make the final culture, there are men practising medicine in Buffalo who are so unscrupulous, and have so little regard for their fellowman, that they will send cultures made from sources other than the secretions of the patient, in their effort to have quarantine hastily removed.

There is but one satisfactory means of obtaining final cultures and that by the culture being made by a member of the department staff.

As to mild atypic cases, it appears to me there is but one way of limiting the transmission of infection from this source, and that is by a thorough medical inspection of schools.

I do not agree with Dr. Chapin "that official disinfection, as a final precautionary measure has little value in preventing the spread of the common contagious diseases," but to the contrary, consider that official disinfection constitutes

one of the most effective means of combating most diseases, and the prime reason that more noticeable results have not been obtained, elsewhere, as in the city of Buffalo, is that we have placed too great a reliance upon the fumigation alone, and have disregarded other features, some of which I have been able to enumerate, in the endeavor to disinfect terminally.

# WAS DR. HARLAN'S CASE OF ABSENCE OF UTERUS, OVARIES, VAGINA, REPORTED IN THE JOURNAL OF THE AMER- ICAN MEDICAL ASSOCIATION A UNIQUE CASE?

BY

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In the *Journal of the American Medical Association* for February 9, 1907, Dr. Earl Harlan, of Cincinnati, reports: "A case of congenital absence of the uterus, broad ligaments, tubes and upper two-thirds of the vagina."

The doctor regards it as an almost unique case, for he says: "The case here reported is one of more than usual interest inasmuch as I have been unable, by extensive inquiry and correspondence, to locate one in which the history is parallel. . . . The professional value of this case, outside of the fact of its almost unparalleled occurrence as a congenital deformity, is of great weight and importance. It furnishes conclusive evidence of the fact that the stimulus which produces menstruation originates in the ovaries, and that this important function can be fully discharged in the complete absence of every other pelvic organ of the internal genitalia."

He quotes Mayo as saying: "I have seen but four cases of the kind you are reporting." And Kelly as saying: "We have had a number of such cases here and rarely have done an operation." Badwin says: "I have never seen a parallel case." And Ochsner: "I have had similar cases in which there existed a rudimentary formation of the uterus, tubes or vagina and in which these organs were represented by fascia-like formations, but have never

seen a case in which the uterus was entirely absent."

Dr. Harlan's case was in brief as follows:

A girl, aged 18, had never menstruated, but since she was 16 years old at intervals of about every three months she had swellings, as she termed them, in the right and left iliac regions. On pressure these were tender and painful. No pain or tenderness over region of uterus; no pain or heaviness in back or down the thighs, but following the swelling of these tumors there was for several days a bloody flux, and all symptoms subsided. Complete absence of uterus, tubes, broad ligaments, and upper two-thirds of vagina was proved by an operation, performed to remove these, at times, painful swellings. The ovaries hung suspended in folds of the peritoneum from the sides of the pelvis.

It was my fortune, while in a hospital in New York City, to have under my care a case somewhat similar to the foregoing case; and although it was reported by me in the *American Journal of Obstetrics*, vol. xiv, it may not be unprofitable to refer to it here, in connection with this case, and also to refer to some literature of the subject which I then looked up.

My case was in brief this:

Patient, aged 46, native of Ireland, had never menstruated, or had the usual prodromal symptoms of the menstrual period. There were the figure, voice, bearing, breasts and nipples of the female. She had a double inguinal hernia and in the labium majus of the right side were three quite, firm, round bodies. The largest was the size of a testicle of a boy of five years, the two other bodies were smaller, less firm, and more like a bunch of knotted veins. In the left side, in same position, were two swellings like those in the right labium, but smaller in size. From these bodies could be traced upward into the external abdominal ring a cord, not unlike the spermatic cord, but smaller. These bodies could not be dislodged from the labium and had been in their present position as long as the patient could remember. Each labium majus was larger and more pendulous than normal.

I supposed these tumors were ovaries, but I asked Dr. Paul F. Mundé to make an examination of the case and express his opinion regarding these bodies in the labia. He regarded my patient not as a female, but as a male, and said her name should be Martin and

not Mary. "The two bodies in the labia majoræ are certainly testicles. . . . The vagina is about three inches long and perfect, and virginæ hymen also perfect. But there is no uterus, and no ovaries. Pelvis is empty, as finger in rectum and sound in bladder show. The curious point is the normal clitoris and the female aspect of patient, breasts and all—chiefly the absence of the rudimentary penis. There is, however, no doubt about the sex, I think."

I also described the case to Professor T. Gailard Thomas and he expressed a wish to see the patient. He did not agree with Dr. Mundé regarding her sex, but regarded the bodies as ovaries. He did find the same condition above the short vagina and in the pelvic cavity that Dr. Mundé describes.

This case, and also Dr. Harlan's, take an additional interest when we surround them with some literature that pertains to this class of cases. I took occasion to look up the subject when I reported my case, and I think it of interest enough to refer briefly to it here. I presume much more has been added in reported cases since that time, but I have had no occasion to look up the matter.

Dr. Mundé said he was influenced in his decision regarding the sex of my patient by a case reported by Dr. Leopold, of Leipzig, a few years before.

In this patient there was every appearance of a female, yet examination revealed a blind vagina, no uterus, and in place of ovaries two testicles in the groin. The patient was aged 50, married 25 years, never menstruated, but was always in good health. In the upper part of the labium majus, on each side, was a small round body and from this extended a cord up through the inguinal canal to the pelvis. The patient had two sisters, neither of whom had ever menstruated or had children, though both were married.<sup>1</sup>

Dr. Thomas Chambers reported in the *Transactions of the London Obstetrical Society*, for 1879, a case in which every appearance was that of a female.

The patient was aged 24, appeared to be a rather good looking, well-developed female, breasts well developed, voice feminine. The

patient had never menstruated or suffered from periodic pains about the pelvis. In each groin was a firm round body, resting against the outer borders of the recti muscles. The one on the right side was three by two and a half inches in size; the left, two by one and a half inches. They had occupied their present position as long as the patient could remember. They were tender to the touch, and at times painful if injured in any way while doing domestic work. They could not be dislodged from this place, though they were somewhat movable. An examination showed the external genitals somewhat undeveloped though of female type. Clitoris small but well formed. The vagina was a smooth cone-shaped opening, about one inch in length, having its cone directed upward behind the pubes. Into the top of this cone the meatus urinarius emptied. There was no os or cervix uteri; no uterus or ovaries could be found, though the examination was repeated by several experts, while patient was under ether. These tumors were removed and examined microscopically by a committee appointed by the society. They were found to be testicles, having in some parts of the gland a tubular development equal to that of a child two years old.

In an other case, reported by Ricco,<sup>2</sup> and referred to by Leopold, the subject was aged 80, had lived as a married woman, external organs normal. Vagina was six centimeters long; no uterus, tubes or uterine ligaments. The testicles were located as in the foregoing case and each had an epididymis and vas deferens.

In Steglehner's case,<sup>2</sup> the subject was an elegant young lady of 23, slender figure and all the outlines of a female, breasts were developed. She had normal vulva, but narrow vagina, small clitoris. Postmortem examination showed absence of uterus, ovaries, and tubes. But in each inguinal canal was found a testicle and epididymis.

In Giraud's case the type was more masculine than any of those mentioned but the patient, aged 40, had lived as a married woman and her real sex had never been suspected. There was found on autopsy a rather large clitoris, a prostatic gland, two testicles on either side of the clitoris. These were supplied with seminal vesicles. The vagina was blind. There were no uterus, tubes or ovaries.

The following case is more like Dr. Harlan's

<sup>1</sup> Case is reported in the *Archiv. für Gynäkologie*, vol. xiii, 1875.

<sup>2</sup> Todd's *Cyclopedia*, ii.

<sup>2</sup> See Leopold's paper.

than these here recorded. Dr. Oldham<sup>1</sup> reports the case:

The uterus and vagina were absent while the other sexual characteristics were those of a well-formed female. In the right groin was a tumor as large as a goose egg, and every three or four weeks would get tender and painful for a few days and then subside. The one in the left groin was the size of a walnut and would behave the same way. These had been noticed since puberty, and at times would disappear, the patient thought.

In another case there was a tumor the size of chestnut in each groin, very movable but never painful. The patient had the appearance of a well-formed female.

Gardner saw one case with a right inguino-ovarian hernia. At each period it would enlarge and become tender and painful.

In 1877 Esmarch removed both ovaries that were lodged in the groins of a patient aged 22. Every four weeks they became painful and tender. They were irreducible but movable. There was no trace of a vagina or uterus, though the external organs were normal.

In 1871 English tabulated 38 cases of this variety of herna. In 27 it was the inguinal variety, and these were all double. In 17 of the 38 cases the hernia was congenital and these 17 were double.

In the discussion which followed the presentation of Chamber's case before the London Obstetrical Society, Dr. Wiltshire said: "This case was one of the most instructive and important that had been brought before the society for some time. It showed that cases of true hernia of the ovary were certainly rare; and some of the supposed instances were, like the case in question, examples of imperfect male creatures."

Dr. John Williams said: "Hernia of the ovary was undoubtedly met, but it was generally, if not in all cases, acquired: and there was no case recorded of congenital hernia of both ovaries, in which the evidence was such as could be trusted. No examination had been made of tumors in the groin, and evidence thus obtained of their true nature. In Dr. Chamber's case, however, this was supplied, and the nature of the tumors put at rest. They were testicles

and not ovaries. It was to be expected that they were testicles, for these organs pass down the inguinal canal normally in order to descend to the scrotum, whereas the ovaries are by no means likely to enter the inguinal ring. Moreover, inguinal hernia was rare in females. In these cases, there were no symptoms which could be attributed to ovarian function, for there was no molimen. It is far more probable that congenital tumors in the groin are testicles than ovaries, and no case should be accepted as ovaries, unless the evidence on the point sets it beyond cavil."

It would seem, in view of these recorded cases, of tumors outside the abdominal or pelvic cavity, and congenital, as they almost always are, that this is a judicious conclusion.

It would appear, also, when measured up by this same evidence, that Dr. Mundé was probably right in his conclusion regarding the sex of my patient, and that *she* was a *male* and not a female. These cases also show that Dr. Harlan's case was far from unparalleled and unique.

One point more I wish to refer to, and it is the remark made by Dr. Williams: "*Inguinal hernia is rare in females.*" I think this is a very generally accepted belief. But is it true? Some years ago I had occasion to look this matter up, and I found this dictum is not true. It depends upon whether a female with a hernia has borne a child or not. If she has not, she is more likely to have an inguinal hernia than a femoral; if she has borne a child it is more like to be a femoral than an inguinal.

Statistics show this: Of 2,589 women who had borne one child, or more, 1,553 had femoral hernia and 1,036 had inguinal hernia. Of 1,235 women who had never borne a child, 755 had inguinal hernia, and 480 had femoral hernia. And in girls under 20, Berketi's statistics of London show 193 patients and my own statistics 147, or a total of 340. There were 314 inguinal hernias and only 26 femoral or if we may safely assume that all these girls under 20 had never borne a child (and I am very certain my 147 can come under that class, we have a grand total of 1,575 women with 1,069 inguinal, and only 506 femoral hernias.

<sup>1</sup> Proc. Royal Soc., vol. viii.

## HOW TO CURE SPLEENS FOR FOOD.

BY

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The fact that animal spleens are good to eat was first publicly announced in a paper of mine entitled "Blood Therapy" published in pamphlet form in April, 1904.<sup>1</sup> In a subsequent article on the "Edibility of Animal Spleens," dated February 10, 1906,<sup>2</sup> this statement was repeated and enlarged upon. Immediately after the appearance of this paper Dr. J. M. Taylor, of Boise City, Idaho, printed a communication<sup>3</sup> to the effect that the spleens of hogs and cattle were commonly eaten by the farmers of the south and west. Synchronously Dr. A. Spencer Kaufman, of Philadelphia, informed me by letter that they were considered a great delicacy among the German Jews. My friend Dr. Ephraim Cutter, of New York, wrote me that he had been apprised of the same fact by a Jewish butcher of that city. A very intelligent colored woman, a native of North Carolina, told me that hogs' spleens were habitually eaten by the negroes in the Southern States and were considered "good for the blood". A young colored man, born in Springfield, Mass., told me his father used to keep hogs and always ate the spleens. These statements fully corroborate the fact which I had ascertained by personal experiment.

In my paper of last year I remarked that spleens in their natural state were unmarketable on account of their softness and liability to decomposition, and that they could not be kept over night even upon ice, but that the application of heat by the coagulation of their albuminous constituents gave them a consistency to be cut, chewed and eaten like ordinary meat. Also that they kept better after being cooked.

I have tried all ways of cooking them, broiling, frying, steaming and boiling. The method of cooking is quite indifferent, the only object being to give them a firm consistency. My experiments in this line were greatly aided by my friend Mr. Frank D. Chase, an expert chemist and mining engineer. We also tried the

experiment of hashing and drying them and baking them into biscuits with complete success. I found these biscuits could be kept a good while when protected from air and moisture.

For a simple and easy method, capable of being applied by wholesale at the slaughter-houses where the animals are killed, boiling would seem most available. The time required is from 20 to 30 minutes. The addition of salt to the water, as suggested to me by my friend Dr. Robert T. Edes, formerly professor of clinical medicine in Harvard University, prevents osmotic changes in the pulp and corpuscles. The proper strength is one ounce to one gallon, the same strength as histologic salt solution. After boiling the spleens should be packed on ice and may be kept several days or even a week without spoiling. I kept some a full week in this way in a box outside my office window in freezing weather. In this condition they can be safely handled and marketed like ordinary meat. They could be kept and sold in the retail shops, or peddled from house to house in carts. They could be transported in refrigerator cars for considerable distances, and supplied in quantities to hospitals and institutions.

All this could be easily brought about if the medical profession could be persuaded to accept the published testimony as to their value as a health food in cases of anemia, debility and nervous weakness, and to prescribe them for their patients. In this way a demand would be created which the butchers would be glad enough to supply. At present spleens are considered quite worthless at the slaughter-houses and are simply thrown away as offal. If they could once be made fashionable they would soon command the same price as sweetbreads, *viz.* 50 cents per pound. The sweetbread (pancreas) contains but little nourishment and is valued chiefly for its ready digestibility and agreeable flavor.

Spleens are equally digestible, of far richer flavor and contain a much greater amount of nourishment. They contain by analysis  $\frac{3}{4}$  gr. iron and  $1\frac{1}{2}$  gr. phosphorus per ounce. The spleen, in fact, is the very choicest morsel of

flesh in the whole animal carcass and should be valued accordingly. If I could induce some of our hospital physicians to try them on a large scale in the public institutions and make a systematic series of blood counts as a crucial test of their efficacy, I should feel myself well repaid for the time and labor bestowed on the subject.

#### REFERENCES.

<sup>1</sup>Additional Papers on the Blood, Chap. vi, Boston, 1904.

<sup>2</sup>*American Medicine*, Feb. 10, 1906.

<sup>3</sup>*American Medicine*, March 31, 1906.

## THE TRUE CAUSE AND SEQUENCE OF THE HEART-BEAT.

BY

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and

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The subject of the automatic rhythmicity of the heart has long constituted one of the fundamental subjects of physiologic investigation. Although a great deal of investigation has been done on this faithful organ, and numerous facts, physiologic and otherwise, have accumulated, yet little as yet is known. The various views and theories proposed and held by the different generations before us only show how little is known and how much is yet to be known. The literature that has accumulated on this subject has indeed become so great as to deter the inquirer, and the objects of this little paper are to review such important facts as have been demonstrated, and to judge from these the theories which are now held, and to deduct such conclusions as the facts call forth. Our modern conception of this important problem is said to date from Haller, who first taught that the heart, although constantly regulated by the central nervous system, is automatic. By automaticity we mean that the stimuli which excite it to activity arise

within the tissue itself and are not brought to it from an extrinsic source. This important fact having been established three important questions present themselves: What is the nature of the inner stimulus? Does it act constantly or intermittently producing rhythmic contraction? Upon what does it act?

Concerning the first question much speculation and experiments have been directed toward unraveling its nature. While the older physiologists tried to find an explanation in the composition of the blood and lymph and have directed their attention especially to the organic constituents, it has been shown that the organic constituents are of very little importance if at all; and indeed, the heart may be kept beating for hours if provision be made to irrigate it with a solution of certain inorganic salts. It was first shown by Merunowicz that an aqueous extract of the ash of blood had the same effect as the blood itself. Later Ringer showed that by a solution of sodium, calcium and potassium salts he was able to keep the heart beating for a long period and he laid special emphasis upon the importance of calcium salt. As soon as this was known it was attempted by Howell, Loeb and others to ascertain the role played by each of the ions of sodium, calcium and potassium. The results of their investigations may be summarized as follows: 1. The sodium maintains normal osmotic pressure as well as irritability and contractibility of the musculature. 2. The calcium is absolutely necessary to the contractibility and irritability. When this salt is present in excessive proportions it causes a condition of tonic contraction designated as calcium rigor. 3. The potassium is not absolutely necessary to the contractility of the heart muscle and when it is present in excessive proportions it causes a condition of extreme relaxation designated as potassium inhibition.

From these facts two views were proposed, one of which attributed the origin of the heart-beat directly to the alternating action of the inorganic salts, and another which held that the origin of the heart-beat—the inner stimulus—arises from some unknown reaction, but that

it cannot produce contraction of the cardiac muscle without the presence of the proper inorganic salts. In direct opposition to these views another, first proposed by Langendroff, holds that the inner stimulus is the product of metabolic activity formed during each contraction and stimulating it to a new contraction. It was assumed that the nutritive material in the heart exists in some nonavailable form—like glycogen—and that during each systole some of this nonavailable material is changed into an available form. Attention was directed to the fact that oxygen is absolutely necessary to the heart-beat and that one of the main products of metabolic activity through oxidation is carbon dioxid, and also that carbon dioxid is a powerful excitant to the cardiac musculature.

Such were the conditions of affairs when in the latter part of 1906 we first undertook our work. Because of the fact that oxygen is absolutely necessary to the heart-beat and that a mammalian's heart can be kept beating for a very long period with Ringer's solution if provision be made to carry more oxygen than can be carried in simple physical solution, and further, the fact that an addition of a trace of alkali,  $\text{H Na CO}_3$ , .003 percent increases the effectiveness of the solution, it seems clear to us that the heart-beat is not due directly to the alternating action of the inorganic salts, for while no great importance can be attached to the fact that oxygen is absolutely necessary to the heart-beat and that a mammalian heart can be kept beating for a long period with a greater supply of oxygen, yet taken together they point a suspicious finger against the statement that the salts alone act. Furthermore, the fact that the trace of alkali increases the effectiveness of Ringer's solution taken together with the unanswered questions—Why does the heart pause between each systole and diastole, why do not the inorganic salts now act since it is in its most irritable phase?—all this proves conclusively the fact that the heart-beat is not due directly to the alternating action of the inorganic salts. As we shall see later these salts play an impor-

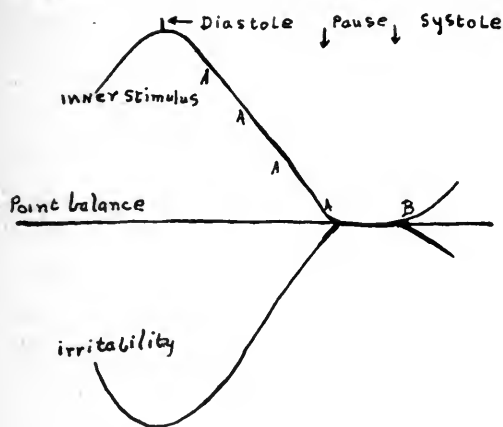
tant, indeed an essential role in the cause of the heart-beat.

In this dilemma it is impossible to assume that the inorganic salts should give origin to the heart-beat, by their alternating action, for the reason as stated, or that the carbon dioxid, the waste product of metabolic activity, should give rise to each new contraction because of the objection to be urged that if, during each systole that product of metabolic activity is formed the heart ought to go into tonic contraction. But this objection is readily settled by the fact that the heart is irritable in diastole only.

Even so, still other formidable questions remain to be answered. Why does not the heart contract during diastole instead of pausing? It will be recalled to mind that, first, the venous end of the heart contracts, then the auricle, and later it is followed by the ventricle, after which there is a period of complete rest of the heart. The question arises, why does the heart rest at a time when it is in its most irritable phase? It must be remembered that the waste products of metabolic activity are being continually removed by the blood. It follows that the stimulus, if it be the product of metabolic activity, must be greater in amount and therefore in strength, immediately after it has been formed than after a lapse of some time. Indeed it is perfectly clear that if that product of metabolic activity is not able to produce contraction of the heart in the middle of diastole it surely cannot produce a contraction in the end of diastole, or, in other words at the beginning of systole. For proof of this we must simply bear in mind that whatever products are formed during each systole they must all be removed before the next systole begins. If it were otherwise—nay, if only the smallest particle remained—then in a short time the waste products would so accumulate and so depress the heart that it could no longer respond to any stimulus. What occurs may be graphically represented:

It will be seen from the diagram that if the stimulus is not able to produce a contraction at that period in the cardiac cycle which is

represented at A, it cannot produce a contraction at that period which is represented at B, for, while irritability is increasing, the stimulus is proportionally decreasing. Still further, it must be remembered that if the heart is irrigated with blood from which the calcium has been removed by precipitation with sodium oxalate, the heart will cease to beat in spite of the fact that all of the other constituents of the blood are present. This shows clearly that the waste products of metabolic activity are not the causes of the heart-beat. Why does not the heart beat now? Indeed we have removed nothing but the calcium. Because of these reasons and the unanswered questions why does the trace of alkali increase the effectiveness of Ringer's solution and also



many others more or less important, we had to accept this fact—which only shows our ignorance—that the inner stimulus is formed by some unknown reaction, but it cannot produce a contraction in the absence of the proper inorganic salts.

From the foregoing considerations it will be seen that we are in almost total ignorance of the cause of the heart-beat and that it is a most difficult task, if not indeed an impossible one to discover the inner stimulus, and more so to isolate it. Under these conditions we began a series of experiments looking toward the discovery and if possible to the isolation of the inner stimulus.

The first step undertaken in this difficult problem was to decide whether the inner stim-

ulus acts constantly or intermittently and to ascertain in case it was intermittent in what phase of the cardiac cycle the stimulus is formed. By those who upheld the neurogenic theory it was first assumed that the inner stimulus acted intermittently, but subsequently by the experiments of numerous investigators, this view was changed to the assertion that it acted constantly, producing rhythmic contractions. It is hardly necessary to go into a detailed discussion of this point, but it suffices, for our purpose, to say that numerous experiments have more or less clearly demonstrated the fact that the stimulus, whatever it may be, acts intermittently; the real problem is to ascertain in what period of the cardiac cycle the stimulus is formed. For the reasons already stated in regard to the theory which holds that the inner stimulus is the product of metabolic activity, we concluded that the inner stimulus must be formed during the pause which the heart takes between diastole and systole; and the experiments confirmed this supposition. In carrying out this experiment we excised the heart of a frog and at the very moment when the heart began its systole macerated it. The object was to catch the heart just before systole, so that whatever stimulus had been produced during the pause will not have had the opportunity of acting upon the heart muscle. Before proceeding, however, to extract the inner stimulus, we must lay special emphasis upon the fact that there is only one proper moment—just before systole—at which we can obtain the stimulus. At no other period can it be obtained, for if we macerate it before, the inner stimulus will not have been formed and if we do it later it will have been destroyed for reasons to be given presently. It is because of the neglect of this important fact that physiologists have so far been unable to discover or isolate the stimulus.

Having now caught the heart at the proper moment and macerated it, let us, before directing our efforts toward isolating it, see in what way we can prove that the substance which we isolated is the inner stimulus. Obviously,

if we apply this substance to a muscle preparation it will cause it to contract. But now the question arises whether it will cause a single contraction or a series of rhythmic contractions. From experiments which will be set forth further on, we will see that we should only get a single contraction, because through the activity of the inner stimulus an anti-inner stimulus is formed which inhibits or destroys it; and since the muscle cannot produce the inner stimulus it will only contract once.

The solution used for extracting the inner stimulus was a solution of glycerin and water, or, instead, the juice may be pressed out of the tissue. In the former method by using very little of the solution and allowing it considerable time, one may be able to get a strong solution of the inner stimulus. From experiments performed with the inner stimulus the following facts were discovered which may be considered as the ten fundamental laws of the heart-beat: 1. The substance which we extracted—the inner stimulus—is an enzyme. 2. That the enzyme is secreted as a zymogen or proenzyme. 3. That like thrombin this enzyme requires the action of calcium salt to activate it. 4. That other closely allied salts may activate the enzyme. Thus strontium may more or less perfectly replace the calcium. 5. That through the activity of the enzyme or directly from it, is formed a specific antizymogen.

6. That this antizymogen is activated by the potassium salts. 7. That potassium salts are not absolutely necessary for the activation of the antienzyme. 8. That other salts may more or less perfectly replace the potassium. 9. That antienzyme inhibits the action of or destroys the enzyme. 10. The enzyme and the antienzyme act best in a slightly alkaline media.

Several hundred experiments were performed among which the following may be selected as the most important:

EXPERIMENT 1.—A muscle preparation was made and upon the muscle a little of the extract was placed. There was absolutely no contraction.

EXPERIMENT 2.—A little calcium chlorid was added to the extract and a little of it applied to the muscle. A contraction was at once obtained.

The explanation of these two experiments and also of the third is very simple. The substance in our extract—the inner stimulus—is in an inactive form, but when a little calcium chlorid or strontium is added it becomes active.

EXPERIMENT 3.—In this experiment there was added to the extract a little strontium salt instead of calcium. Then it was applied to a muscle and a contraction was obtained.

EXPERIMENT 4.—We took a little of the extract; added a little calcium chlorid and heated it. Then the temperature was lowered to 37° C. and the extract applied to the muscle. No contraction was obtained.

EXPERIMENT 5.—A little of our extract was cooled and applied to the muscle. No contraction resulted. The temperature of the extract was then raised to 37° C. and a contraction obtained.

EXPERIMENT 6.—To a little of the extract a little calcium chlorid was added with a slight trace of alkali. The action of the extract when applied to the muscle was better than in the second experiment.

These last three experiments showed that the inner stimulus is an enzyme. Like others of its kind it is killed by heat; its activity inhibited by low temperature. It acts best in a slightly alkali media; and as we have seen from the first three experiments the enzyme is in an inactive form or a zymogen and is activated by calcium or closely allied salts as strontium.

EXPERIMENT 7.—To the extract a little calcium and potassium salts were added and when applied to the muscle a contraction and a quick relaxation were obtained.

EXPERIMENT 8.—To a little of the extract there was added a little calcium chlorid and a contraction was obtained as usual. Then we collected as much as possible and applied it to another muscle. Again a contraction was obtained.

EXPERIMENT 9.—After adding to a little of the extract, a little calcium chlorid and potassium chlorid, the extract was applied to a muscle and a contraction was obtained. Then we collected as much as possible and applied it to another muscle. No contraction was obtained.

**EXPERIMENT 10.**—The seventh experiment was repeated with the addition of a slight trace of alkali. The effect of the extract was slightly better than in that experiment.

**EXPERIMENT 11.**—In this experiment we did the same as in the seventh, only replacing the potassium by sodium. The result was about the same.

From these experiments it was ascertained that through the activity of the enzyme, an antienzyme is formed, which is activated by potassium or other salts, as sodium, and which inhibits the action of or destroys the enzyme.

That the potassium has no action on the enzyme itself is shown by the fact that if we add potassium to the enzyme its action is not inhibited or destroyed until the enzyme is allowed to act.

From these and many other experiments the true cause of the heart-beat can now be understood. The venous end of the heart contracts, then the auricles and later the ventricles. Then there is a period of complete rest of the whole heart. During this period through a definite secretory action a proenzyme is secreted. Then the calcium present activates this proenzyme, and once activated, it acts upon the heart, causing it to contract. By the activity of the enzyme or directly from it is now formed a specific antizymogen. Having been formed it is activated by the potassium. When once activated it inhibits the action or destroys enzyme, causing the heart to relax. After this the heart pause and again the cardiac cycle is repeated.

There remains but one more thing to be explained—sequence of the heart-beat. This sequence can be easily explained if we bear in mind the following experiment. Take a heart and separate the venous end from the auricles and the auricles from the ventricles. Now if an extract is made of each part separately, the extract from the venous end will be the strongest while that of the ventricle will be the weakest.

Now since the enzyme is stronger at the venous end, it will respond more quickly and therefore set a rate for the whole heart. The enzyme in the ventricle together with the wave

of contraction spreading over the ventricle will now be able to cause the heart to contract very forcibly. It must not be forgotten that the ventricle is, however, able to respond to the inner stimulus, but since it is less here than at the venous end or in the auricle it will take longer time for the enzyme to become sufficiently strong to cause a contraction—hence the slower rate of the ventricle.

From the foregoing we see very clearly demonstrated the importance of the inorganic salts in the causation of the heart-beat on the one hand and the secretory action of the heart—the unknown reaction—on the other hand. It also becomes clear why some physiologists were led to the view that the inner stimulus is the product of metabolic activity. But they did not determine what this product of metabolic activity—this unknown reaction—was. It is the enzyme and its antienzyme. Other physiologists hold that the inorganic salts are the essential ones in the cause of the heart-beat. But they have contented themselves with the expression of this view. The importance of the inorganic salts cannot be denied but here as nowhere else it can be seen why the inorganic salts are so important.

Having ascertained the true cause and sequence of the heart-beat let us in conclusion sum up the important facts known about the heart and indicate how they accord with the view here maintained.

1. *The presence of oxygen is absolutely necessary to the heart-beat.* It can be readily observed why the heart absolutely requires oxygen. If it did not have it the metabolic activity could not go on and therefore could not secrete the enzyme. By this we do not mean to imply that oxygen belongs to the molecule of the enzyme. It may or may not; but like all other tissue it requires oxygen for its metabolic activity and through it (metabolic activity) the enzyme is formed.

2. *A mammalian heart can be kept beating for a long period if provision is made to carry a larger supply of oxygen than can be carried in simple physical solution.* In the first place the mammalian heart having very little oxygen

compared with its size, there will be very little metabolic activity, but if a greater supply is carried, then we increase the metabolic activity, and thereby increase the formation of the enzyme.

3. *The presence of the inorganic salts is absolutely necessary.* It is hardly necessary to comment upon this. The calcium and potassium act as activators while the sodium preserves normal osmotic pressure. If the sodium be removed then we will have an abnormal heart and if we do not have the calcium and potassium how can we have activation? If we do not have activation, how can we have contraction?

4. *The calcium is absolutely necessary.* As we have seen there are no other salts present which activate the enzyme, therefore it is absolutely necessary. If there were other substance present which could activate the enzyme then we could easily dispense with the calcium, but as it is there are none.

5. *The potassium is not absolutely necessary.* Since the sodium present can activate the antienzyme naturally we can dispense with the potassium. If sodium could not activate the antienzyme then the potassium would be as important as the calcium.

6. *The addition of a trace of alkali,  $HNaCO_3$ , 0.003 percent increases the effectiveness of the solution of the inorganic salts.* The reason for this is evident. The enzymes act best as we have seen in a slightly alkaline media. Thus the enzyme, when we add the trace of alkali, is acting at its best and that is the reason why we find our solution more effective.

7. *The inorganic salts cannot be chosen at random.* As in case of thrombin other salts than Ca will not activate the prothrombin and so in the case of our enzymes. From our experiments we saw how little substitution can be done. Strontium may replace the calcium. It is exactly the same as in case of thrombin. Here indeed is a strong analogy.

8. *The heart irrigated with blood from which the calcium has been removed by precipitation with sodium oxalate ceases to beat.*

This is natural and what we should expect from what we have learned. If the calcium is not present how can activation of the enzyme go on; and if there is no activation how can the heart beat?

9. *The heart always gives maximal contraction.* We must bear in mind one property of an enzyme, viz., that the amount is not in proportion to the work done. Under normal condition the enzyme, whether it be little or much, will give a full contraction if it gives any at all.

10. *The escape of the heart from inhibition.* This may readily be explained. During the whole period of inhibition the enzyme is being formed. At last it grows so strong that it overcomes the inhibitory effect of the vagus and causes the heart to contract. The inhibitory effect of the vagus having been broken the heart keeps contracting.

11. *The fibrillar contraction.* When fibrillar contractions occur in the ventricle they are usually fatal. The auricle, however, usually recovers from them. If we recall what we have ascertained concerning the formation of enzyme, viz.: that more enzyme is formed in the auricle than in the ventricle then the explanation is simple. The enzyme because it is stronger in the auricle is able to bring, as it were, the different fibers into coordination, whereas in the ventricle the enzyme is not strong enough.

12. *The sequence of the heart-beat.* This has been set forth under the zymogenic theory.

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**Suspected Cholera in Silesia.**—A railway workman in Prussian Silesia, died from what is supposed to be cholera. The Imperial health authorities have put the cholera detention houses in readiness, three of them in the suburbs of Berlin, the official reports showing the progress made by cholera in Russia to be disquieting. Thirty new cases have been discovered in the Government of Jaroslav, and the latest issue of a leading Russian medical journal, the *Wratschebuaja Gazeta*, enumerates 304 cases and 89 deaths in six of the Russian provinces in the week following its preceding issue. Every precaution is being taken on the Prussian frontier.

## SPECIAL ARTICLES.

### SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.

#### Twenty-third and Twenty-fourth Meetings.

Proceedings Reported by the Secretary,

WILLIAM J. GIES, PH. D.,  
of New York.

#### Twenty-third Meeting.

New York University and Bellevue Hospital Medical College. May 22, 1907. President Flexner in the chair.

*Members Present.*—Atkinson, Beebe, Brooks, Calkins, Carrel, Emerson, Ewing, Field, Flexner, Gibson, Gies, Lillie, Lusk, Meyer, Murlin, Salant, Shaffer, Teague, Wadsworth, Weil, Wolf, Yatsu.

#### ABSTRACTS OF THE COMMUNICATIONS.<sup>1</sup>

*The Osmotic Pressure of Colloidal Solutions and the Influence of Electrolytes and Nonelectrolytes on Such Pressure.*—RALPH S. LILLIE.

Determinations were made of the osmotic pressure of gelatin and egg albumin; the colloids were used (1) in approximately pure solution, and (2) after the addition of various electrolytes and nonelectrolytes to the colloidal solution; in this case the employed substance was added in the same concentration to the outer fluid of the osmometer so as to pervade the entire system on both sides of the membrane in uniform concentration. The osmotic effects observed under these conditions can be due only to the colloid and not to the added substance. The colloidal solution was found, however, after the addition of an acid, alkali, or neutral salt, to exhibit an altered osmotic pressure, the degree of alteration varying with the nature and concentration of the added electrolyte. Nonelectrolytes were found to have no appreciable influence on the osmotic pressure of these colloids.

*Hemolysis in Eclampsia.*—JAMES EWING.

The author's observations indicate that the eclamptic toxin is not a hemolytic agent derived from the placenta, and that hemolysis is not necessarily associated with the lesions of the viscera. Semb's observations, in which he

demonstrates visceral lesions strongly resembling those of a hemolytic serum, cannot be accepted as evidence of a specific eclamptic toxin. Histological study of the liver of eclampsia indicates that the characteristic lesions consist in fibrin thrombi and not in agglutination and hemolysis of red cells, and that when hemolysis occurs it results from the products of degeneration and necrosis of endothelial and hepatic cells. It is, therefore, probably an entirely secondary factor in the disease.

*Glycocoll Nitrogen in the Metabolism of the Dog.*—JOHN R. MURLIN.

While attempting to explain the behavior of gelatin in metabolism it occurred to the author that much significance might be attributed to its high content of glycocoll. It is well known that the nitrogen of gelatin is not ordinarily retained in the body but appears quantitatively in the urine, chiefly as urea. But when fed with meat and an abundance of carbohydrate, it is possible to establish nitrogen equilibrium near the fasting level, if two-thirds of the total quantity of nitrogen fed is present in protein-free gelatin and only one-third present in the meat. Would glycocoll, if fed in the same way, behave as does gelatin? The author's experiments answered this question in the affirmative.

*An Hydrodynamic Explanation of Mitotic Figures.*—ARTHUR B. LAMB.

The distinctly polar arrangement of the chromatin substance about the astral centers in dividing cells, combined with the pronounced curvature of the astral rays and of the spindle fibers, have demanded the assumption of some polar force as universally operative. On such an assumption it is, of course, necessary to assume further that astral centers represent either opposite or like poles. On the alternative of opposite poles, we should expect, with any force so far proposed, a configuration of astral rays simulating that of iron filings between *opposite* magnetic poles, coupled with a mutual *attraction* of the astral centers. On the other alternative, we should similarly expect a configuration of astral rays and spindle fibers simulating that of iron filings between *like* magnetic poles, coupled with a mutual *repulsion* of the astral centers. Actually, we have neither of these conditions, but instead, a configuration like that of iron filings between *opposite* magnetic poles and at the same time an *apparent repulsion* between the astral centers or the centrosomes.

This is not the case with the forces of attraction or repulsion existing between bodies oscil-

<sup>1</sup>The abstracts presented in this account of the proceedings have been greatly condensed from abstracts prepared by the authors themselves. The latter abstracts of the communications appear in Number 6 of Volume IV of the Society's proceedings, which may be obtained from the Secretary.

lating or pulsating in a fluid medium. More specifically, if two spheres are pulsating synchronously, and in opposite phase, or oscillating synchronously and in the same phase, they will repel one another, *but at the same time the field between them will stimulate the configuration of iron filings between opposite magnetic poles.*<sup>1</sup>

If then we assume that the centrosomes are pulsating in opposite phase, or better, oscillating in the same phase, we will obtain the desired repulsion and at the same time have a configuration like that actually observed.

The configuration taken by the chromosomes is explicable on the same grounds. Indeed, it is not necessary to assume any independent motion on their part, but simply to consider it an induction phenomenon. The tri- and multipolar spindles are also better explained on these hydrodynamic grounds than on previous assumptions.

The foregoing explanation is, of course, pure hypothesis, with no support other than the facts it seeks to explain. There is, however, nothing inherently impossible in it, and it may provoke fresh observation and new ideas.

*Transfusion Experiments in Dogs Showing Artificially Implanted Tumors.*—GEORGE W. CRILE and S. P. BEEBE.

Direct transfusion of the whole blood from immune dogs to dogs with actively growing, artificially implanted tumors has been conducted in six animals. In the first set of three, sufficient time has elapsed to determine the outcome, which was as follows:

I. Dog 116. Planted Jan. 7, 1907. Tumors were first seen on Feb. 20; continued to grow slowly. March 20, transfusion experiment: dog was bled 400 cc. and immediately transfused with 550 cc. of blood from dog 244, in which implantation had occurred on Jan. 18; tumors were first noticed on Feb. 6, and had continued to grow until Feb. 20, when they began to regress. Regression was complete March 7. Three days after transfusion, dog 244 was again planted with tumor. Four plants were made with positive results in three and tumors are growing at the present time. The immunity which dog 244 possessed as a result of the previous growth and regression of the tumors could not have been very marked. The effect of this transfusion upon tumors of dog 116 was negative, since they continued to grow until the death of the animal in a cachectic condition four weeks later.

II. Dog 125. Weight 13 kilos. Tumors were planted Dec. 6. All plants grew and continued to increase in size until the day of transfusion, March 20. On this day the dog was bled 500 cc. and immediately transfused with the same quantity of blood from dog 163. Following the bleeding and transfusion the tumors of dog 125 became softer and began to regress. One tumor has entirely disappeared and the others are subsiding.

III. Dog 133. Weight 17 kilos. Tumors planted Jan. 31; first growth noticed Feb. 13, and continued active until day of transfusion. March 20, bled 600 cc. and transfused 1,500 cc. from dog 289. The latter animal was 19½ kilos in weight in very good physical condition and naturally immune to the tumor. Following this transfusion, which was the largest and of the best quality that any animal in this series received, the tumors of dog 133 began to regress immediately, and at the present time the regression is complete.

The authors postponed discussion of these results.

*Transplantation of the Thigh from One Dog to Another.*—ALEXIS CARREL.

On April 23, 1907, at 9.50 a. m., a medium sized dog was killed with chloroform. At 10.20 a. m. the left thigh of the cadaver was amputated just below its middle part, perfused with Locke solution and placed on a table of the laboratory, the temperature being 88–90° F.

At 11 a. m., a medium-sized bitch was etherized; her left thigh was amputated and immediately replaced by the thigh of the dead dog. The reconstruction of the thigh began by the suture of the bone, the adductors and quadriceps. Then the femoral vessels were united and the circulation reestablished at 1 p. m. The operation was completed by the suture of the nerves, muscles, aponeuroses and skin, and the limb placed in a plaster-of-paris apparatus.

On April 23, 24 and 25 the animal remained in good condition and walked on her three normal feet. The transplanted limb was warmer than the normal one and its circulation very active. On April 26, she appeared to be sick. There was a phlegmon of the thigh. Incisions were made in Scarpa's triangle and on the transplanted limb, which was warm. Hemorrhage of red blood occurred from the incisions in the transplanted limb.

During the succeeding days, the circulation of the limb remained active, the foot became swollen and the general condition of the animal declined. On May 1, a large abscess was detected near the pelvis and opened. A small

<sup>1</sup>See Bjerknes's text-book, "Hydrodynamische Fernkräfte," J. A. Barth, Leipzig, 1902.

incision having been made on the foot of the transplanted limb, hemorrhage of red blood occurred. The general condition of the animal was very low. On May 2, the animal died of septicemia.

Then, it was found that the lumen of the femoral vessels was free of thrombus, and the intima, smooth and glistening. There was no deposit of fibrin on the lines of suture. In spite of the infection, the union of the vessels was excellent. The skin and the muscles were cicatrized and the ends of the femur firmly united by the ligature.

*The Bacteriotherapy of Leprosy.*—PAUL G. WOOLLEY (by invitation).

It seemed to the author that, lacking pure cultures for the purpose, he might make the leprosy patient serve as his own culture medium. It is well known how abundant are the bacilli in the lepra nodule. The author excised a nodule from the arm of an advanced and wretched case of the tubercular form of leprosy. The nodule was very rich in bacilli. It was ground with sand and salt solution; centrifugalized; heated to 65–70° C. for 15 minutes, and treated with enough 5 percent carbolic acid to make a suspension containing 0.5 percent of the acid. This suspension was rich in bacilli. Of it subcutaneous inoculations, of 0.01 ccm. were made at intervals, the intervals depending on the general condition of the patient. Experience with the more exact methods possible with the analogous disease, tuberculosis, indicates that minimal inoculations of the dead bacilli must be continued over a long period before a genuine arrest is attained; even, therefore, with the most favorable outcome, the author does not expect to report the results of this treatment for months to come. The author communicated the method in order that others with fuller opportunities may test it.

*Direct Silver Staining of Spirochetes and Flagellated Bacteria.*—SIMON FLEXNER.

The discussion of the nature of the structure now called spirochete (*Treponema pallida*)—whether a microorganism or some histological elements—led Flexner to try to effect the silver staining directly upon smear preparations prepared from serum exudates obtained upon syphilitic lesions. While engaged unsuccessfully in this endeavor, Stern\* of Prague, published a simple method for staining the spirochetes directly with silver nitrate. When the deposit of silver presents a metallic sheen, the impregnation is regarded as sufficient. Flexner has

found the method very simple and sufficient; but he has obtained better results from long (3–4 days) than from short (1–2 days) exposures. The length of exposure required will depend somewhat upon the weather (strength of light) and the thickness of the spread. Moderately heavy spreads have given him better results than thinner ones, and impression preparations better than smear preparations.

Other spirochetal organisms, from the buccal cavity, etc., may be silvered by this method, and bacteria may also be silvered. In a few comparative tests which were made, the degree of impregnation was greatest with the pallida. Whether this is to be accounted for by elective affinity or difference of medium in which the organisms were embedded cannot be said. In the course of these examinations, the author came across examples of flagellated bacteria from the buccal cavity in which the flagella were distinctly silvered. He attempted to stain the flagella of certain bacteria—*B. typhosus*, paratyphosus, pyocyaneus, hog cholera—from pure cultures, but unsuccessfully. The terminal cilia of the pallida appeared not to be stained by the silver.

Flexner observed instances in which the silvered films showed many more spirochetæ pallida than the corresponding preparations stained by Giemsa's or Proca's methods.

*On the Bacterial Production of Skatol and Its Occurrence in the Human Intestinal Tract.*—C. A. HERTER.

A large number of facultative and strict anaërobic organisms have been studied with respect to their ability to form skatol. The anaërobic *B. putrificus* (strain isolated by Bienstock) and one strain of the bacillus of malignant edema (obtained from Professor Theobald Smith) were found to produce skatol in peptone bouillon, although it was not possible to determine the conditions under which skatol could be regularly obtained through the action of these bacteria. It was found that skatol is rarely present in the intestinal tract except in conditions of disease associated with intestinal putrefaction. Usually skatol is associated with indol in such conditions, although there are instances in which the intestinal contents contain little or no indol, but, relatively speaking, considerable skatol. This has been observed, heretofore, only in putrefactive processes associated with pronounced clinical manifestations.

*A Spirochete Found in the Blood of a Wild Rat.*—W. J. MACNEAL.

Of 39 wild rats (*Mus decumanus*) caught at Morgantown, W. Va., by MacNeal, one has

\* Stern: Berl. klin. Woch., 1907, xlv, 400.

shown a minute, actively motile, spiral organism in the blood. It is present in very small numbers and careful search with high magnification is necessary to detect its presence.

The parasite stains readily by the various modifications of the Romanowsky stain, and very intensely by the rapid method recommended for clinical staining of *Spirochæta pallida*.<sup>1</sup> It takes a uniform, deep, violet-red color. The measurement of a number of individuals shows a marked variation in length, the shortest forms consisting of one and three-quarters turns or nodes, having a length of  $1.75\mu$ ; the longest, consisting of three and one-half turns, being  $3.55\mu$  long.

The infection is readily transferred to other wild rats by intraperitoneal injection of a very small drop of infected blood in normal salt solution. In many cases, not more than 10 or 20 parasites could have been present in the infection, yet, so far, the wild rats have always developed the infection. The parasites never become very numerous and disappear in from one to nine days. This apparent recovery is then followed by repeated relapses. The parasite may become more numerous in the blood during the relapse than in the primary invasion. Neither a certain recovery nor a fatal result has, as yet, been observed.

White rats are susceptible, with an incubation period of four to eight days, according to the dose employed. The house mouse (*Mus musculus*) is apparently more resistant.

Similar spirochetes have been described by Carter (in the rat), Lingard (in the bandicoot, *Mus giganteus*), by Nicolle and Comte (in the bat), by Wenyon and by Breinl and Kinghorn (in the house mouse); all these in the circulating blood. Borrel and Gaylord have described spiral organisms in mouse carcinomas, and one of the forms found by Borrel has been shown by Wenyon to be identical with his *Spirochæta muris*, found in the blood of mice. Morphologically the parasite found here in the rat is apparently identical with this one of Borrel and Wenyon. Its behavior in animals is somewhat different. MacNeal tentatively suggests for it the name *Spirochæta muris*, var. *Virginiana*, following the principle suggested by Calkins.<sup>2</sup> Its specific relation to that organism must be left for further work to determine.

#### *Experimental Ligation of Splenic and Portal*

<sup>1</sup> MacNeal: Journal Amer. Med. Assn., Feb. 16, 1907.

<sup>2</sup> Calkins: Journal of Infectious Diseases, April 10, 1907.

*Veins, With the Aim of Producing a Form of Splenic Anemia.*—ALDRED S. WARTHIN.

The author's results indicate that obstruction of the splenic veins of dogs by ligation is not followed by a fibroid hyperplasia of the spleen but by a partial atrophy. A more or less complete venous collateral circulation is always produced. The picture of splenic anemia as seen in man cannot, therefore, be reproduced in the dog, by an obstruction to the venous outflow from the spleen.

*An Experimental Control of Fischer's Attraxin Theory.*—C. SNOW. (Communicated by ALDRED S. WARTHIN.)

Fischer<sup>1</sup> recently reported from Hibbert's laboratory that by injecting a solution of Scharlach R. Sudan III or indophenol in olive oil under the skin of the ears of rabbits he was able to get an epithelial proliferation which was not to be distinguished histologically from a squamous-celled carcinoma in man. He was not able to get this result with other substances acting as irritants, and therefore assumed the existence of specific bodies—attraxins—in the injected solution, which exerted a chemotactic influence on the epithelial cells.

His work has been repeated by Snow as nearly as was possible from the meager description given of his technic. Three old and three young rabbits received, under the skin of the ear, injections of the Scharlach R-olive oil solution, and the injected tissue excised and examined at times varying from 7 to 61 days. The results show that the solution has absolutely no influence on the epithelial elements, but acts as a mild irritant, inducing a chronic inflammation with slight reaction on the part of the connective tissue in the case of the old rabbits, and a greater reaction with the formation of foreign body giant cells in the case of the young rabbits, the conclusion being that the attraxin theory is without sound foundation, insofar as "Scarlet-oil" is concerned.

*The Effects of Struggle on the Content of White Cells in the Lymph.*—F. PEYTON ROUS. (Communicated by ALDRED S. WARTHIN.)

Preliminary determinations, with the animal (dog) quiet, showed that for any one individual the number of leukocytes per cmm. of lymph, from the thoracic duct, was practically constant during the one to six hours during which observations were made. With struggle, as others have shown, the lymph flow increases sharply in amount for a few minutes. With this the author found a corresponding increase

<sup>1</sup> Fischer: Münch. Med. Wochenschrift, Oct. 16, 1906.

in cell content, an increase marked in "cell concentration" per cmm. of lymph and in the total number of elements passed.

An additional conclusion reached was that, for a given individual, the lymph glands seem "set" to produce cells at definite rate. This rate has a wide range for reasons unknown. The cell increase with struggle comes from the peripheral lymph system rather than from sedimented cells in the receptaculum chyli, and is probably dependent on another factor besides increased lymph flow (a supposition upheld by later experiments with lymphagogues).

The facts elicited have a bearing on the "physiological mononucleosis" of the blood observed in man following active exercise, on the disappearance of this after prolonged exertion (25 mile run), and the absolute decrease in mononuclears sometimes seen.

*A Lipolytic Form of Hemolysis.*—HIDEYO NOGUCHI.

Lipase is, under some conditions, an efficient hemolytic agent which acts, however, not directly upon the red corpuscles, but indirectly through the liberation from available fats of the active fatty acids. Neutral fats are not hemolytic, but they become so under the influence of lipase.

Potassium cyanid and sodium fluorid in 1:10,000 solution inhibit the action of lipase on the fats, and calcium chlorid removes the lytic agent from an active mixture. Since the bile salts are known to increase lipolysis, the effects of the sodium salts of cholic, glycocholic and taurocholic acids in  $n/500$  solutions were tested on lipolytic hemolysis. The rate of hemolysis was accelerated.

*On the Mechanism by Which Water is Eliminated from the Blood Capillaries in the Active Salivary Glands.*—A. J. CARLSON, J. R. GREER and F. C. BECHT.

There is a spontaneous flow of lymph from the quiescent parotid gland of the horse. It is probable that part of the lymph that flows from the neck lymphatics in an anesthetized dog with all the salivary glands at rest comes from the salivary glands. When the parotid of the horse is thrown into activity by stimulation of the cranial secretory nerves, or by injection of pilocarpin into the blood, there is no appreciable increase in the output of lymph from the gland as compared with that from the gland at rest. This is true both of the spontaneous flow and of the flow aided by direct massage of the gland. The activity of the submaxillary does not appreciably influence the flow of lymph from the neck lymphatic in the dog. This con-

clusion is based on experiments on 13 dogs. If the activity of the submaxillary gland increases the output of lymph from the neck ducts, the increase is too slight to be detected by present methods, and is not one-tenth of the saliva eliminated by the gland, as Barcroft's observations would seem to demand.

In dogs under *light* ether anesthesia, perfectly quiescent and with all the salivary glands at rest, there is always a spontaneous flow of lymph from the neck lymphatics.

The osmotic pressure of the lymph from the active parotid of the horse is not the same in all animals. The lymph obtained from the active gland had in three cases considerably lower osmotic pressure than the serum, a fact which apparently eliminates osmosis as the factor effecting the transfer of water from the blood capillaries in the active gland. The osmotic pressure of the lymph from the neck lymphatics of the horse, collected with the animal under chloroform anesthesia, may be of slightly higher, of the same or of considerably lower osmotic pressure than the serum. The osmotic pressure of the lymph from the neck lymphatics of the dog is usually lower than that of the serum. It is rarely greater. The thoracic lymph was in one case of the same, in the other case, of a higher osmotic pressure than the serum. It is therefore probable that the osmotic pressure of the thoracic lymph is usually greater than that of the neck lymph.

Under the conditions of the experiments—ether or chloroform anesthesia for from two to four hours—the osmotic pressure of the serum at the end of the experiments was in many cases greater than at the beginning. The same difference is sometimes exhibited by the lymph collected from the same lymphatic but at different periods of the experiment.

*On the Dissociation in Solutions of the Neutral Caseinates of Sodium and Ammonium.*—T. BRAILSFORD ROBERTSON.

In the case of the neutral caseinate of *sodium* the sum of the ionic velocities was found to be slightly greater than the velocity of the Na ion, indicating a specific velocity of  $2.6 \times 10^{-5}$  cm. per sec. for the casein anion at 25° C. In the case of *ammonium* caseinate, however, the sum of the ionic velocities was found to be considerably less than the specific velocity of the ammonium ion. This was interpreted as indicating the presence in this solution of complex cations containing ammonium. Other considerations show that the effect is not due to viscosity. If casein be regarded as an ampholyte of the type HXOH, the sodium salt would be of the

type  $\text{Na}^+ + \text{XOH}^-$ ; it is possible that the ammonium salt in solution forms ions of the type  $\text{NH}_4\text{X}^+ + \text{OH}^-$  or  $\text{NH}_4\text{X}^+ + \text{XOH}^-$ .

*The Altmann Granules in Kidney and Liver and their Relation to Granular and Fatty Degeneration.*—WILLIAM OPHÜLS.

In the kidneys of dogs, rabbits, and guinea-pigs the author found the following arrangement of the Altmann granules: In the connecting and convoluted tubules, and in the descending parts of the loops of Henle, the granules are rather coarse, very definitely rod shaped and arranged in radial rows in the basilar two-thirds of the cells, often so closely set end to end that it is difficult to make out the dividing lines between them. In the part of the cells directly adjoining the lumen there are few scattered, short, rod-shaped granules and none in the "Bürstenbesatz." These details are naturally more plainly shown in the large cells of the convoluted tubules, but in a general way the smaller cells in the connecting tubules and in the descending loops of Henle resemble them very closely. Some groups of convoluted tubules have much coarser granules than others. Ophüls has not been able to determine whether this is a constant anatomic difference or due to different functional stages. If the granules have any relation to the function of the cells, which seems probable, one would surmise that the connecting tubules cannot purely serve the function of conducting urine from one place to another, all the more so since in the large ducts of the pyramids which serve this purpose alone, the granules are very scanty and irregularly arranged. In the large light cells of the ascending parts of the Henle loops, the granules are exceedingly small, also slightly rod shaped, extremely numerous and scattered all through the cells in an irregular fashion. This condition might be used as an argument in favor of a difference in function of this portion of the tubules. In the cells of the liver of these animals, the granules vary greatly in size from just visible to quite coarse granules. All of them are rods, some short, others quite long and more or less wavy. The granules are scattered irregularly all over the cells.

In granular degeneration, the characteristic macroscopic and microscopic pictures of which can be best produced by intravenous injection of potassium bichromate, the granules enlarge in size, become more or less spherical, lose their normal arrangement and stain very deeply with the Altmann stain, contrary to what has been generally assumed after the work of Schilling,<sup>1</sup>

who seems to be the only investigator of this question. In the liver the change is similar, all cells being equally involved. The albuminous granules in granular degeneration, then, are not new formed granules but to a great degree the enlarged and disarranged normal Altmann granules. The author's observations on the kidneys and liver confirm the view that in fatty degeneration, fat in all cases appears first in and around the Altmann granules. It seemed more as if the granules were changed to fat *in toto*.

These observations indicate why granular and fatty degeneration so frequently occur simultaneously, for both appear to be the result of abnormal conditions in the Altmann granules.

*The Relation of Anatomic Structure to Function.*—WILLIAM OPHÜLS.

The kidney appeared to be the organ best suited for the study of this problem, for, by collection of the urine directly after its discharge from the ureters, the exact moment of the occurrence of the disturbance could be ascertained. It is possible to produce albuminuria in dogs within a few hours by intravenous injection of potassium bichromate (about 2-3 cc. of a 2 percent solution). If Altmann specimens are made from the kidneys at this time no lesions are found. That the poison nevertheless acts upon the epithelial cells and the granules in them is shown by the subsequent development of severe lesion in them.

In phlorhizin glycosuria, likewise, no lesions are demonstrable by this method, although we are fairly certain that the excretion of sugar in this case is due to a lesion in the kidney.

The author believes that quite a number of the anatomic changes, which we now look upon as primary, are the result rather than the cause of the functional disturbances, although the disarrangement brought about by them naturally often aggravates the original condition. It is questionable whether the real primary lesion in these cases is of such character as ever to be demonstrable by physical methods.

*Proteid Poisons.*—VICTOR C. VAUGHAN.

The author has been able by diverse methods to split proteids—bacterial, vegetable and animal—into poisonous and nonpoisonous products.

The poisons obtained from the proteids are similar but are not identical. All are soluble in both water and absolute alcohol, more freely in the latter than in the former. The aqueous solutions are acid and slowly decompose sodium bicarbonate forming salts apparently, and these are less poisonous than the free acids. The aqueous solutions give the general color reactions

<sup>1</sup> Schilling: Virch. Arch., 1897, cxxv, 410.

for proteids with the exception of that of Molisch, and some of them give this reaction. However, most of the proteid poisons obtained by cleavage of the proteid molecule contain no carbohydrate and are free from phosphorus.

These poisons when injected into animals intraabdominally, subcutaneously or intravenously induce characteristic symptoms and when administered in sufficient quantity kill promptly.

Death is due to failure of respiration and the heart often continues to beat for some minutes after respiration has ceased. It seems most probable that death is due to the direct action of the poisons on the respiratory center. It is inferred from the readiness with which recovery may follow nonfatal doses that the poison cripples but does not destroy the cells of the respiratory center.

All attempts to produce antitoxins with these proteid poisons have, so far, failed. It is true that repeated treatments of animals with non-fatal doses of the poisons from the colon and typhoid bacilli enable animals to bear from two to four times the ordinarily fatal doses of living cultures of these bacteria, but this seems to be due to an increased resistance rather than to a true immunity. The condition is not specific and may be induced by the poisons obtained from peptone or egg white, as well as with that obtained by cleavage of the homologous bacterium.

Attempts have been made to ascertain the chemical constitution of the proteid poisons by splitting them up with mineral acids, but at present these experiments have not yielded satisfactory knowledge and work along this line is being continued. The physiologic action of the proteid poisons leads to the suspicion that they contain a neurin group, but so far the author has not been able to demonstrate the presence of such a radical.

*Observations on the Living Developing Nerve Fiber.*—ROSS G. HARRISON.

The immediate object of the author's experiments was to devise a method by which the end of a growing nerve could be brought under direct observation while alive, in order that a correct conception might be had regarding what takes place as the fiber extends during embryonic development from the nerve center to the periphery.

The method employed was to locate pieces of embryonic tissue known to give rise to nerve fibers, as, for example, the whole or fragments of the medullary tube, or ectoderm from the branchial region, and to observe their further

development. The pieces were taken from frog embryos about 3 mm. long at which stage *i. e.*, shortly after the closure of the medullary folds, there is no visible differentiation of the nerve elements. After carefully dissecting it out the piece of tissue is removed by a fine pipet to a cover-slip upon which is a drop of lymph freshly drawn from one of the lymph sacs of an adult frog. The lymph clots very quickly, holding the tissue in a fixed position. The cover-slip is then inverted over a hollow slide and the rim sealed with paraffin. When reasonable aseptic precautions are taken, tissues will live under these conditions for a week and in some cases specimens have been kept alive for nearly four weeks. Such specimens may be readily observed from day to day under highly magnifying powers.

While the cell aggregates, which make up the different organs and organ complexes of the embryo, do not undergo normal transformation in form, owing no doubt in part to the abnormal conditions of mechanical tension to which they are subjected, nevertheless the individual tissue elements do differentiate characteristically. Groups of epidermal cells round themselves off into little spheres or stretch out into long bands, their cilia remain active for a week or more and a typical cuticular border develops. Masses of cells taken from the myotomes differentiate into muscle fibers showing fibrillæ with typical striations. When portions of myotomes are left attached to a piece of the medullary cord, the muscle fibers which develop will, after two or three days, exhibit frequent contractions. In pieces of nervous tissue numerous fibers are formed, though owing to the fact that they are developed largely within the mass of transplanted tissue itself, their mode of development cannot always be followed. However, in a large number of cases fibers were observed which left the mass of nerve tissue and extended out into the surrounding lymph clot.

It has not yet been found possible to make permanent specimens which show the isolated nerve fibers completely intact. The structures are so delicate that mere immersion in the preserving fluid is sufficient to cause violent rupture and this very frequently results in the tearing away of the tissue in its entirety from the clot. Nevertheless, sections have been cut of some of the specimens and nerves have been traced from the walls of the medullary tube, but they were in all cases broken off short.

In view of this difficulty an effort, which

resulted successfully, was made to obtain permanent specimens in a somewhat different way. A piece of medullary cord about four or five segments long was excised from an embryo and this was replaced by a cylindrical clot of proper length and caliber, which was obtained by allowing blood or lymph of an adult frog to clot in a capillary tube. No difficulty was experienced in healing the clot into the embryo in proper position. After two, three or four days the specimens were preserved and examined in serial sections. It was found that the funicular fibers from the brain and anterior part of the cord, consisting of naked axones without sheath cells, had grown for a considerable distance into the clot.

These and many other interesting observations described by the author show beyond question that the nerve fiber develops by the outflowing of protoplasm from the central cells. This protoplasm retains its ameboid activity at its distal end, the result being that it is drawn out into a long thread which becomes the axis cylinder. No other cells or living structures take part in this process. The development of the nerve fiber is thus brought about by means of one of the very primitive properties of living protoplasm, ameboid movement, which though probably common to some extent to all the cells of the embryo, is especially accentuated in the nerve cells at this period of development.

*The Presence of Allantoin in the Urine of the Dog During Starvation.*—FRANK P. UNDERHILL.

During the progress of an investigation upon intermediary metabolism it became necessary to subject the experimental animals to periods of starvation lasting from ten days to two weeks. From the urine of these dogs allantoin separated spontaneously in pure white crystals and the presence of this substance in the urine was constant. The presence of allantoin in the urine during starvation has not been recorded hitherto. This observation makes it probable that allantoin is a constant constituent of the urine of the dog.

*Alkaloidal Compounds of Mucoids, Nucleoproteins, and Other Proteins.*—WALTER H. EDDY and WILLIAM J. GIES.

In continuation of their studies of protein compounds the authors have observed that nucleoprotein, mucoid, caseinogen and alkali albuminate form water-soluble products with alkaloids. By intimately mixing samples of the purified moist protein and the pure alkaloid, especially with the latter in considerable excess, soluble

products are formed, which may be precipitated by alcohol or alcohol-ether, and which, after purification and drying, readily dissolve in water. Such aqueous solutions are neutral to litmus, and the proteins may be readily precipitated from the solutions by slightly acidifying them.

The purification of such products as well as their chemical and pharmacological study, is under way.

### Twenty-fourth Meeting.

Carnegie Institution's Station for Experimental Evolution, Cold Spring Harbor, Long Island, New York. June 22, 1907. President Flexner in the chair.

*Members Present.*—Atkinson, Beebe, Carrel, Davenport, Donaldson, Ewing, Field, Flexner, Gibson, Gies, Hatcher, Lusk, Meltzer, Meyer, Shaffer, Wallace, Wadsworth.

*Members Elected.*—C. H. Bunting, Rufus I. Cole, Charles W. Duval, William W. Ford, Frederick P. Gay, Isaac F. Harris, James W. Jobling, Oskar Klotz, Paul A. Lewis, Thomas B. Osborne, H. T. Ricketts.

### ABSTRACTS OF THE COMMUNICATIONS.<sup>1</sup>

*Demonstrations of Methods and Results of Pedigree Breeding of Plants and Animals.*—CHARLES B. DAVENPORT.

Four series of pedigreed poultry were shown to illustrate certain laws of inheritance, as follows: (1) Darwin's case of "reversion;" (2) the production of a frizzle-silky race; (3) particulate inheritance of plumage color; (4) independence in inheritance of the different characters.

There were also demonstrations of inheritance of characters in canaries, of *Oenothera* (evening primrose) and its mutants, of branching and branchless sunflowers, of variability of chromosomes in *Oenothera* and its mutants, and of inheritance of abnormal wing venation in the vinegar fly, *Drosophila*.

*Further Studies of the Effects of the Exposure of Sperm to Röntgen Rays.*—CHARLES R. BARDEEN.

Eggs of *Rana pipiens* fertilized by sperm exposed to röntgen rays for one hour all developed abnormally. The abnormalities began to appear during the gastrulation period.

<sup>1</sup>The abstracts presented in this account of the proceedings have been greatly condensed from abstracts prepared by the authors themselves. The latter abstracts of the communications appear in Number 7 of Volume IV of the Society's proceedings, which may be obtained from the Secretary.

Cases of spina bifida are not uncommon. In a lot of several hundred eggs, nearly all of which were fertilized, only one specimen survived two weeks. This was much stunted in growth and very abnormal in shape. Of 80 eggs of the common toad exposed only 15 minutes to röntgen rays only four larvae survived one month. Most of the larvae were markedly abnormal in shape. Of the survivors, two are large and apparently normal and two are undersized. Only one individual out of 150 eggs, fertilized by sperm exposed 37 minutes to the rays, has survived one month and this individual is but half the normal length and breadth. In a group of 250 eggs, fertilized by sperm exposed to röntgen rays for an hour and ten minutes, all exhibited marked abnormalities of development and the least abnormal larva and longest survivor died a week after the eggs were fertilized.

The susceptibility of sperm of anura to röntgen rays is in marked contrast to that of paramécia. Exposure of paramécia for 12 hours to rays of the same intensity caused no visible effects on form, rate of division or process of conjugation.

The author exposed the sperm of the toad to heat at 50° and 65° C. for from 15 to 20 minutes. This exposure destroyed the fertilizing power of most of the spermatozoa but the few eggs fertilized by such sperm developed normally. Sperm exposed for from 15 to 20 minutes to the following solutions: 1/40 percent formol, 12.5 percent ethyl alcohol, 1 percent NaCl, 1/32 percent HCl and 1/32 percent KOH, had the power of fertilizing toad eggs. Practically all of the resulting larvae that have been preserved appeared normal at the end of one month after fertilization of the eggs. Sperm exposed to stronger solutions of the same substance for 15 to 20 minutes seems to lose power of fertilizing. No abnormal larvae have developed from the few eggs thus fertilized.

*On the Absorption of Toxins by the Nerves.*  
—CYRUS W. FIELD.

In a large number of animals into which both tetanus and diphtheria toxin had been injected, Field found that the toxin was present in the peripheral nerves leading from the inoculated area; and by the use of the right dose, and at a certain time, free toxin could be demonstrated in the cord, although the other tissues of the body, including the blood, liver, spleen and kidneys contained no free toxin.

Not only is this true for diphtheria and tetanus but it is likewise true for the toxin produced from *B. botulinus* and also for colloidal ferric

hydrate. In the case of colloidal ferric hydrate, by removing the nerves and cord, and subjecting them to treatment with a solution of hydrogen sulphid, Field was able to detect the presence of iron. By using small doses he was able to show the presence of these colloids in the nerves near the points of injection and in the spinal cord, but of none whatever in the other tissues, except at the points of inoculation.

The author concluded that tetanus toxin does not travel by way of the axis cylinder because of any specific attraction of the nerve tissue for this toxin, but it passes up because the lymphatic flow of the nerve is progressing constantly from the periphery to the center. For this reason the toxin, when injected subcutaneously or intramuscularly, is taken up by the nerves and passes to the cord; and the first symptom to develop is the local tetanus because the local cells are the first that come in contact with the toxin.

It is a wellknown fact that in giving diphtheria or tetanus toxin intravenously a much greater dose is required to cause death than when either is injected subcutaneously or intramuscularly. The reasons for this are first, that the toxin injected into the blood may be combined with some of the constituents of the blood and therefore rendered inactive; second, that by injection into the blood, the toxin is diluted to a very great extent, whereas when injected subcutaneously, a portion passes into the lymphatics of the nerves and is not mixed with the general body fluids, before it reaches the central nervous system.

The author's general conclusion was that tetanus does not travel up a nerve by reason of any specific attraction of nervous tissue but because the lymphatic flow in a nerve is from the periphery toward the center.

*On the Formation of a Specific Precipitin in Rabbits After Inoculation with Colloidal Platinum and Colloidal Silver.*—CYRUS W. FIELD.

Some time ago in testing the precipitating effect of rabbit serum on various positive and negative colloids, Field found that such serum precipitated colloidal platinum and colloidal silver to a fair degree. Serum from one rabbit precipitated colloidal platinum completely at 1-100, slightly at 1-200 and not at all at 1-500. This serum precipitated colloidal silver completely at 1-10, partially at 1-100 and not at all at 1-250. After receiving three injections of colloidal platinum in three weeks this rabbit's serum then precipitated colloidal platinum completely at 1-1000, slightly at 1-1250 and not

at all at 1-1500, whereas it precipitated colloidal silver completely at 1-100, slightly at 1-250 and not at all at 1-500.

Serum from another rabbit originally precipitated colloidal platinum completely at 1-50, partially at 1-100 and not at all at 1-250. The same figures held good for colloidal silver. After three injections of colloidal silver during three weeks, this rabbit's serum precipitated the colloidal silver completely at 1-500, partially at 1-1000, and not at all at 1-1250, whereas colloidal platinum was completely precipitated at 1-200, partially at 1-500 and not at all at 1-1000.

In other words the precipitating power of the serum of the first rabbit, after it received three injections of the colloidal platinum, had increased from 1-100 to 1-1000 (ten times), whereas for the colloidal silver there was only a very slight increase. Serum from the second rabbit, which received colloidal silver, increased its precipitating power from 1-100 to 1-500, whereas for the colloidal platinum, from 1-100, to 1-250. In both these rabbits there was then an increase in the precipitating power of the serum after injection with these colloidal metals, and it would seem that they increased more for the metal injected than for the other.

*Remote Results of Transplantations of Blood-vessels.*—ALEXIS CARREL.

The results of arterio-arterial, veno-venous and arterio-venous anastomoses have remained excellent for many months. No stenoses or aneurysms have been observed on the arterial anastomoses even six to seven months after operation. No stenosis occurred after venous anastomosis: A cat, in which an Eck fistula was made 18 months ago by Carrel and Guthrie is still in good health. The same is true of an arterio-venous anastomosis: The jugular vein and the carotid artery of a dog were anastomosed by Carrel and Guthrie 22 months ago and now strong thrill and pulsations can easily be detected by palpation of the jugular vein. The modifications of the vascular walls are produced mainly by the changes of blood-pressure. No great change occurs if the blood-pressure of the transplanted vessel be not modified. Segments of carotid, aorta or vena cava of one animal, transplanted in the carotid, aorta or vena cava of another animal of the same size and species, do not undergo any important anatomical modification. If blood-pressure is diminished, the wall of the transplanted vessel becomes thinner. Six months after the operation, it was found that the wall of the carotid transplanted

in the external jugular vein was thinner than the normal one. If blood-pressure is increased, hypertrophy of the wall ensues. A segment of external jugular vein interposed between the cut ends of the carotid artery was a little dilated and its wall was as thick as the arterial wall, eight months after the operation. In other cases, there was no dilation of the lumen of the vessels. As a rule when a vein is anastomosed uniterminally to an artery, its lumen is found to be dilated, six or seven months after the operation. Nevertheless, after one year the lumen may progressively diminish in size, as was seen in a dog operated upon 22 months ago.

It may be concluded that transplanted blood-vessels adapt themselves to the pressure by thinning or thickening their walls.

*The Dependence of Gastric Secretion upon the Internal Secretion of the Salivary Glands.*—JOHN C. HEMMETER. (Communicated by S. J. MELTZER.)

The relations of the gastric secretion to the salivary glands are illustrated by the following clinical and experimental observations:

1. In four cases of Mikulicz's disease, with normal conditions of the blood, the stomach was found to secrete no gastric juice during the course of the disease. Mikulicz's disease consists of a benign chronic swelling of all the salivary and lacrymal glands.

2. In dogs with accessory stomachs (Pawlow) the removal of all the salivary glands abolishes permanently all gastric secretion.

3. The gastric secretion is not started in such dogs by feeding them with food masticated and well insalivated by other normal dogs.

4. The abolished gastric secretion is temporarily resumed by peritoneal or intravenous injections of extracts of salivary glands of normal dogs.

5. This temporary resumption takes place even if the stomach be completely isolated from the central nervous system.

These observations justify the conclusion that normal gastric secretion depends upon the internal secretion of the salivary glands.

*The Influence of Diuresis upon the Toxic Dose of Magnesium Salts.*—S. J. MELTZER.

A dose of two grams of magnesium sulfate per kilo is absolutely fatal for the rabbit; the animal dies of respiratory paralysis in less than an hour. All the animals recovered from the effects of such a dose, however, if an intramuscular injection of diuretin was given soon after the subcutaneous injection of the mag-

nesium salt. Diuretin is theobromin and acts as a diuretic. The deeply narcotized animals usually urinate about 15 or 20 minutes after its injection; by that time, at least, the bladder can be felt to be full. The largest dose that should be given is about 0.1 gram. In larger doses diuretin itself is liable to become toxic.

When the dose of the magnesium sulfate exceeded two grams per kilo the injection of diuretin alone could not save the animals. But if, in addition to the diuretin, an intravenous infusion of 0.9 percent solution of sodium chlorid was instituted, animals recovered from doses of magnesium sulfate amounting to as much as 2.25 grams per kilo. When still larger doses of the magnesium salt were given, the animals usually died of respiratory paralysis in less than 15 minutes and before any diuresis could have been effected. Animals recovered from doses as large as 2.5 grams per kilo, if, in addition to the diuretin injection and the venous transfusion, artificial respiration was early resorted to. For doses larger than 2.5 grams per kilo all three measures together usually proved of no avail; with this dose the early death of the animal is usually due greatly to paralysis of the heart.

*The Toxicity of Magnesium Nitrate When Given by Mouth.*—S. J. MELTZER.

It is a daily experience that large doses of magnesium sulfate can be taken by mouth without any other than a purgative effect. Meltzer has given to rabbits, by mouth, seven grams or more of magnesium sulfate (in molecular solution) per kilo, without any unfavorable effects. The same applies also to magnesium chlorid and various other magnesium salts. Meltzer has, however, discovered that magnesium *nitrate*, when given *by mouth*, is capable of producing a toxic effect like that of magnesium sulfate when introduced subcutaneously.

When a dose of six grams of magnesium *nitrate* per kilo (in molecular solution) is given by mouth to a rabbit, the animal soon becomes paralyzed and narcotized and dies in from 30 to 40 minutes of respiratory paralysis. Fifteen or 20 minutes after the administration, the appearance as well as behavior of the animal is exactly like that of one which received magnesium sulfate subcutaneously (two grams per kilo). A dose between four and five grams per kilo causes in general the same symptoms but in a gradual way; the animal dies after five or six hours. A dose of between three and four grams causes no serious effects, but for six or eight hours after its administration

the animal remains in a soporous state; it sits in one place with eyes closed and head drooping; a loud noise wakes it up and it attempts to move about or to eat, but in a few minutes it falls asleep again.

This toxicity of the magnesium nitrate is apparently due to its greater absorption from the gastrointestinal canal. It is certainly not due to diminished elimination through the kidneys; on the contrary it acts in some degree as a diuretic, and, when given by subcutaneous injection, the animal withstands a somewhat greater proportionate dose of the nitrate than of the sulfate or chlorid, probably because the nitrate increases somewhat the diuresis.

Meltzer believes that the effects observed cannot be attributed to the nitrate radical ( $\text{NO}_3$ ). He studied the toxic effects of sodium nitrate after administration by mouth and compared the resultant symptoms with those seen after administration of magnesium nitrate; the contrast was sharp. Even with a dose of 12 grams of the sodium nitrate per kilo there is never such anesthesia or paralysis as that caused by the magnesium salts; on the contrary the animal is all excitement and restlessness. Beside, the late death of the animal after administration of sodium nitrate is due to circulatory disturbances, whereas after poisoning with magnesium salts, the animal dies of respiratory paralysis.

*On the Promoting Influence of Heated Tumor Emulsions on Tumor Growth.*—SIMON FLEXNER and J. W. JOBLING.

The authors gave the results of a study of an effect on the growth of a transplantable sarcoma of the rat which is produced by inoculation of rats with an emulsion of the tumor cells, previously heated for half an hour to  $56^\circ\text{C}$ . This emulsion was injected into the peritoneal cavity and the fragments of living tumor were introduced beneath the skin. The promoting effect on the growth of the tumor fragments to be described became evident in several sets of experiments in which the tumor emulsion (*unheated*), blood-serum, bouillon, salt and Ringer solutions were injected in the same manner, with which substances this promoting effect was not obtained. When the inoculation of the fragment of the tumor was made 24 hours after the injection of the unheated emulsion, no difference was noted between the control rats and the rats injected with the enumerated materials, including the *heated* emulsion. But when the fragments were inoculated ten or more days (up to 30 days) later, then the number of tumors which developed in

the rats receiving the *heated* emulsion tended to exceed the controls and the other series mentioned; they grew with greater rapidity so as to reach double the size of the controls or even a still greater size, and showed a far smaller percentage of recoveries (retrogressions). This promoting influence was exerted on the tenth day after inoculation, and various indications suggested that it was less effective at the expiration of 30 days. On the other hand, it appeared that when the injections of heated emulsion were repeated once or twice at ten-day intervals, the conditions of the animal favoring the growth and persistence of the tumors were maintained and possibly were even still further increased.

*On the Chemical Inactivation and Regeneration of Complement.*—HIDEYO NOGUCHI.

It was found that all acids and alkalies are able to inactivate complements when used in sufficient concentrations. With monobasic acids it takes about 1 cc. of  $n/40$  solution to inactivate 1 cc. of active serum. About 1 cc. of  $n/50$  solution of the acid is, as a rule, neutralized by the inherent alkalinity of the serum.

With alkalies 0.3 cc. (ammonium hydrate 0.8 cc.) is sufficient for inactivation. The acids and alkalies are, when used without serum, hemolytic in the quantities stated. But when mixed with the serum they—serum and chemicals—lose their activity mutually.

Alkaline salts of strong acids are not anticomplementary unless a certain limit of concentration is exceeded. Sodium carbonate is anticomplementary in a relative, but not in an absolute sense. All other salts employed are strongly anticomplementary, the magnesium salts being the least inhibiting. Calcium and barium salts of strong acids are absolute anticomplements while the carbonates of these elements may or may not be active upon complements.

Complements which are inactivated by acids can be reactivated by neutralizing the acids with alkalies, and *vice versa*. The action of various acids, alkalies and salts upon complements renders the complement-deviation phenomenon for forensic purposes less safe, because the materials are often impure in practical cases.

Various soluble salts of oleic acid are accelerators of the complementary action of serum.

*A Study of the Influence of Lecithin on Growth.*—A. J. GOLDFARB.

The author's experiments included three series of over 1,200 tadpoles. In each series the lecithin varied in strength from 1/150 per-

cent to 2 percent (the toxic concentration). In one series (1) the tadpoles were not fed, in another (2) they were given minced worm, in the third (3) they were given a liberal supply of plant debris.

*The tadpoles that were kept in lecithin solutions did not show any greater increment in weight or size than the controls of the same series.* There was a marked difference, however, in both the size and weight of tadpoles of one series compared with the tadpoles in the corresponding solution of another series, due to the kind (and presumably the amount) of food given. Individuals of Series 1 were smallest and weighed least; those of Series 3 weighed from three to six times as much and were twice as broad as the tadpoles in the same strength of solution in Series 2.

Young kittens (over 50 in number) were treated as follows:

*Series 1.* Lecithin was injected subcutaneously daily in doses of from 0.0006 to 0.004 gram. Control animals received subcutaneously equal volumes of physiological salt solution. The increase in weight was somewhat greater in the kittens that received the lecithin.

*Series 2.* Lecithin was injected subcutaneously in doses of from 0.01 to 0.32 gram daily. The kittens that received the lecithin gained, in some cases, as much as 7 percent over the control animals.

*Series 3.* Lecithin was fed daily in amounts of from 0.01 to 0.32 gram. With very few exceptions, these kittens weighed from 2 percent to 12 percent more than the controls.

The best results were obtained in the feeding experiments, with doses of from 0.04 to 0.16 gram daily; yet under these conditions, the actual difference in weight between the kittens fed with lecithin and those not so fed was small, amounting on an average to about 7 percent. Whether the same quantity of any other fatty or simple nutrient compound would result in an equal increment has not yet been determined, but will be investigated with other matters bearing upon the interpretation of the results recorded above.

*Comparative Data for the Elementary Composition and the Heat of Combustion of Collagen and Gelatin.*—CHARLOTTE R. MANNING and WILLIAM J. GIES.

Comparative elementary analyses, as well as determinations of the heat of combustion, of many samples of connective tissue collagen and gelatin, have indicated that there is a closer agreement between the mother substance and

its derivative, on these two planes of comparison, than the prevalent idea of their chemical relationship would indicate. The following sample data show this quite clearly:

	C	H	N	Heat of combustion
	percent	percent	percent	calories
Tendocollagen <sup>1</sup>	48.85	8.01	18.02	5.387
Tendogelatin	48.28	7.84	17.56	5.350

The differences between the above figures for nitrogen and hydrogen contents harmonize with the observation by Emmett and Gies that nitrogen is eliminated as ammonia when collagen is converted into gelatin by treatment with hot water, and also strengthen their conclusion that gelatin is not a simple hydrate of collagen.

*On the Fate of Elastose After its Subcutaneous or Intraperitoneal Injection: A Preliminary Inquiry into the Origin and Nature of Bence Jones's Protein.*—REUBEN OTTENBERG and WILLIAM J. GIES.

Bence Jones's protein and crude elastose not only have several proteose properties in common, but, unlike the ordinary proteoses, each is precipitated from its aqueous solution when the latter is gently warmed. Bence Jones's protein occurs in the urine of patients suffering from sarcoma of bone marrow or from osteomalacia. Bone contains considerable elastin-like material (osseoalbumoid). The possibility that Bence Jones's protein may be a derivative of osseoalbumoid, and the great desirability of making our knowledge of this elusive protein more definite, led the authors to undertake a study of a preliminary phase of the work that will be necessary to determine the points at issue.

They sought first to ascertain whether crude elastose, when injected subcutaneously or intraperitoneally, is eliminated in the urine and whether it can be detected there by the heat-precipitation test. When thus introduced in dogs, crude elastose, obtained by peptolysis of ligament elastin prepared by Richards and Gies's method, not only promptly appears in the urine, but may be identified in it by the heat-precipitation test. This observation makes it clear that if elastose is formed in bone or in any other tissue by any pathological process, the elastose thus produced may pass into the urine without material alteration of the characteristic property referred to.

<sup>1</sup> Each of these products was desiccated (before analysis) to constant weight by the Benedict-Manning process in vacuo. See the American Journal of Physiology, 1905, xiii, p. 309.

Before proceeding further in this connection, the authors intend to prepare osseoalbumoid (bone elastin?) in sufficient quantity to permit of a determination of the nature of its proteoses and their fate when injected into animals.

## SANITATION AT JAMESTOWN: TWO OPINIONS.

How the Jamestown Exposition is Rendering Sanitary Service to Virginia.

BY

DR. CHARLES R. GRANDY,  
of Norfolk, Va.

At the invitation of Dr. Irving, I am making use of the *Bulletin* to call the attention of the medical men of Virginia to a few points in the Jamestown Exposition, which they ought to see, but which they are apt to overlook, unless specially directed. The sanitary exhibits I am alluding to have already proved of the greatest educational value to me, and I feel that they can also be of help to other physicians in their daily fight against disease.

The whole exposition is itself one great sanitary exhibit, showing what modern science can do with unhealthy localities, for the farm, which now is transformed into the exposition grounds, was, in years gone by, notorious for its malarial fever. This problem has, however, been successfully handled by the sanitary officer, Dr. Rupert Blue, who has gotten rid of all mosquitos in the neighborhood, though he had some troublesome swamps and marshes to take care of. Some of these have been filled, others opened, so that the tide could get all through them, and allow the fish to find the mosquito larvas, and where this is impossible oil is being sprayed by a force of men under Dr. Jones, of the army. The writer is well acquainted with the locality, having found large number of anopheles there in former years, and this mosquito work has opened his eyes as to the possibility of making healthy some of the worst country in this section of the State. Not only can the doctor see this actual work, but in the very excellent exhibit put by New Jersey in the States' Exhibits Building, he can study from actual specimens the different varieties of mosquitos, and how New Jersey is successfully treating her notorious mosquito problem. In the Government Exhibits (Department of Animal Industry) are shown large models of the *Culex*, *Anopheles* and *Stegomyia*, from which one can learn to

distinguish the different varieties of mosquitos—a most important thing for all physicians to know.

The problem of typhoid fever, a great danger where all large bodies of men are gathered, is also being cared for in a practical way, so that we can safely say that there is little or no danger of contracting it on the exposition grounds. These grounds are well seweraged, and flies are thus kept away from human excrement. Filtered Norfolk city water is supplied to all buildings, and all restaurants are under strict sanitary supervision, and are closed until objectionable food or drink is gotten rid of. All garbage is burned in a large, up-to-date crematory. The way this problem is handled in the United States camp is especially instructive. All excrement is burned in special incinerators, without being handled at all, and from which there is so little odor that there are absolutely no flies in them. The company kitchens and dining-rooms are all well screened, and the water all boiled, though it is originally one of the purest in the State (Norfolk county water), while all garbage is burned in a specially constructed pit. This antityphoid sanitation of the United States camp is in itself worth a trip to the exposition to anyone who is interested in sanitation. A harder problem for the sanitary officers, because it was only recently turned over to them, is Pine Beach, a settlement outside of the exposition grounds. This has only recently been seweraged, and many of the inhabitants have sunk shallow wells, often very near a privy or cess pool. A few cases of typhoid have originated here, but Dr. Blue is working hard to get the wells closed and forcing sewer connections. Until this is done, Pine Beach should be avoided, as it is dangerous from both a moral and sanitary standpoint. It must be remembered, however, that Pine Beach is not the exposition, for it is not even at the main gate, and no one need go there unless he is looking for trouble.

The prevention of another great preventable disease is shown in the exhibit of the National Association for the Study and Prevention of Tuberculosis. Though this exhibit is not at all technical, still it shows, by charts and models, what other States are doing in prevention, as well as the good results obtained in various sanatoriums. Virginia is, however, only represented by a few charts and pictures, sent by the Negro Hampton Normal School, a truly sad commentary on our State, which, at present, has no satisfactory method of collecting vital statistics, no general laws dealing with tubercu-

losis, and no public institutions to care for her thousands of tuberculous patients. It is indeed sad and even mortifying, that Virginia, with its fine historical, educational, agricultural, and mineral exhibits, can show nothing in a sanitary line, for she is doing practically nothing in this direction. The State Board of Health is the first to realize its deficiencies, but with a total annual appropriation of \$4,000 and with no office in which to keep its records, it is apparent that no good work can be done, for we have not even money enough to pay a living salary to our executive officer, who is forced to support himself by his private practice.

I, therefore, take this opportunity not only to call the attention of our physicians to the sanitary features of the exposition, but ask them to consider along with them Virginia's sanitary needs. We do not consider that we are doing all that we should for the State, for we have too much malaria, typhoid fever, and tuberculosis, diseases which the Jamestown Exposition is showing how to control. The State Board of Health is entirely unable to take care of these problems without the active co-operation of the physicians of Virginia, who, in turn, can wake up the people to the appreciation that it is better to spend a dollar on prevention than 50 dollars on the cure of a disease. [Bulletin Virginia Board of Health for July, 1907.]

### Opinion of the War Department.

HEADQUARTERS UNITED STATES TROOPS.  
Camp Captain John Smith,  
Exposition Station, Norfolk, Va.

August 22, 1907.

#### SANITARY CIRCULAR No. 2.

The following instructions prepared by the chief surgeon of the camp are published for the information and guidance of all concerned. As soon as practicable after the receipt of this circular, commanding officers of subcamps will cause it to be read to their several commands:

"The presence of typhoid infection both in and around the exposition grounds, and its entrance into both the cavalry and infantry camps, make it necessary to take extreme measures to guard the command from sickness and death.

"1. No soldiers will be permitted to enter the 'Pine Beach' district, *i. e.*, west of Maryland avenue and north of Ninety-ninth street, and commanding officers will send patrols at proper intervals to compel obedience to this order.

"2. Officers and soldiers will eat and drink only at their messes or clubs. This does not apply to dinner invitations outside the grounds and beyond this vicinity, but in such cases it is presumed that extra care will be taken to avoid dangerous foods.

"3. No fresh milk, cream or ice cream will be introduced into camp.

"4. Only cooked or sterilized foods will be served at messes, excepting such articles as fruits with rinds or skins, and such vegetables as can be scalded before serving.

"5. The same routine as to scalding kitchen and table ware will be observed as in the presence of cholera."

BY COMMAND OF MAJOR GENERAL GRANT.

(Signed) John S. Mallory,  
Major 12th Infantry,  
Adjutant General.

## RECENT EDITORIAL OPINIONS.

**The Journal of the American Medical Association.**—THE RELATION OF "HEART DISEASE" TO SUDDEN DEATH: Nearly half a century ago Stokes protested against the popular conception that sudden death was very common in heart disease. Later Professor Gibson, of Edinburgh, emphasized the same idea. More recently Professor Bouardel, of Paris, has stated that while sudden death does occur as the result of changes in the heart it is more frequently due to changes in the vessels, especially of the brain and kidneys. As the causes for sudden death he places kidney disease first, apoplexy second and cardiac disease third.—THE CONTROL OF INSECT-BORNE DISEASES IN THE ARMY: Malarial diseases among American troops serving both in the Philippine Islands and in the United States reached a maximum in 1900, steadily decreased up till 1904 and have since increased slightly. A careful investigation has shown that very little has been done so far in the way of mechanical protection especially in the proper screening of buildings. An effort is now being made to correct this with the hope that the morbidity from malaria will be reduced below what it is at present. In the way of limiting the number of flies it has now been recommended that the daily accumulations of manure from the stables at military posts be kept in fly proof rooms or bins.—AMBULANCE SPEED: Inasmuch as many of the accidents to ambulances have occurred when there was not particular need of haste it is now suggested that the ambulance surgeon be held responsible

for accidents due to speed greater than is necessary in the particular instance.—THE BRITISH MEDICAL ASSOCIATION ADDRESSES: Suggestive food for thought is found in the addresses of this association which met at Exeter. The main motive in the address of the president, Dr. Henry Davy, was the national importance of the health and the physical culture of the citizen and of making physical exercises an important part of the national system of public education. In the address in surgery Mr. H. T. Butlin, the wellknown authority on morbid growths, gives voice to the opinion that cancer is capable of autoinoculation and that while a broken surface is helpful it is not necessarily essential. Dr W. Hale White, in his address "A Plea for Accuracy of Thought in Medicine," makes some very apt criticisms especially of the use of words whose meaning is vague and indefinite to cover our ignorance of certain subjects or facts, the overworking of certain theories that have a temporary vogue, the dangers in the use of statistics in estimating the value of surgical and other methods, and calls for a healthy skepticism in students and workers in fields of research and investigation.—THE PATHOGENESIS OF DIABETES INSIPIDUS: In accord with the ideas of Tallqvist and Wolf, Seiler in a careful study from Sahli's clinic found that ingestion of large quantities of nitrogenous food by patients with diabetes insipidus is not followed by a rise in the specific gravity of the urine as is the case with normal individuals. The kidneys in such patients seem unable to excrete urine containing nearly so large a proportion of solids as does normal urine. Should insufficient water reach the kidneys to carry out all the accumulating solids, the concentration of solids in the blood will increase, leading to the sensation of thirst which causes the characteristic polydipsia and polyuria of the disease. Seiler ascribes this inability of the kidney to excrete normally concentrated urine to nervous defects. As to therapeutics, the restriction of the amount of fluid taken by the patient should not be carried too far and may be continued as long as there is a corresponding increase in the specific gravity of the urine showing that solids are being excreted.—THE RELATIVE PREVALENCE OF DISEASE AMONG WHITE AND COLORED TROOPS: For troops serving in the United States proper the colored troops almost uniformly have a much lower admission, discharge and noneffective rate for disease, while their deathrate is much higher than that of the whites, the latter being due largely to tubercu-

losis, pneumonia and aneurysm. The colored troops appear to be particularly well adapted to service in the tropics.—**STERILITY AMONG RÖNTGEN-RAYS WORKERS.** Jordon has recently stated that any man who works daily, with the ray for a year or two, even if he takes reasonable care, becomes sterile. It would be of interest to gather statistics on this subject and also to determine whether operators who give up the Röntgen-ray work recover from their sterility. In the meantime every röntgen-ray worker should bear this danger in mind and protect himself so far as possible.—**RENAL CALCULUS AFTER TYPHOID FEVER:** Graves has recently recorded the history of a patient who, six years after an attack of typhoid fever, had symptoms of stone in the left kidney. Operation showed a phosphatic calculus in the ureter and the *Bacillus typhosus* was obtained from the kidney pelvis in pure culture. Such a case certainly suggests a connection between typhoid fever and renal calculi, but it is not wise to generalize from a single case. It may be that the bacillus may be one cause and that beside its presence there must be some predisposing factor, as partial stagnation of urine in the pelvis of the kidney.—**PSYCHIC CONTAGION OF CRIMINAL IMPULSE:** The communication of disease by physical contact is now well recognized. The influence of psychic contagion, however, is just being appreciated. It has frequently been noted that one peculiar suicide or crime is nearly always followed by another of similar kind. Such has been the case recently in and around New York where there has been a series of assaults on little girls and of strangulations. In the normal prophylaxis against the occurrence of these crimes regulations should be made to limit the widespread publication of the details of such crimes and to follow the crime with the infliction of some striking form of punishment with as little delay as possible.—**THE PHENOMENON OF HYPERSUSCEPTIBILITY:** Rosenau and Anderson have shown that horse serum injected into guineapigs renders the animal susceptible to a subsequent injection and that if the latter is given after an interval of ten days the hypersusceptibility manifests itself by severe symptoms which may result in death. They have recently shown that this same phenomenon may be induced by any of the higher forms of albuminous substances but not by the lower forms of nitrogenous compounds. By the use of certain bacterial proteids they observed an immunity to the corresponding infections following the second spaced injection. These results should lead

to further study.—**THE VALUE OF ANTITOXIN IN TETANUS PROPHYLAXIS:** In the past five years there is not a single report in the American literature of the development of tetanus in a person who had received a timely prophylactic dose of tetanus antitoxin. In European literature, however, a considerable number of such cases are now recorded. A careful analysis of these cases, moreover, shows that many of them, developed for good and sufficient reasons, as, for instance, the giving of antitoxin too long after infection, the use of inactive serum, etc. On the other hand we have the many thousands of cases in which tetanus antitoxin has been used prophylactically with success, so that the actual number of failures is surprisingly small. Even unsuccessful prophylaxis with antitoxin increases the chances of recovery in those cases in which tetanus does appear.—**PUBLIC OPINION AND MEDICAL REFORM:** Following the publication of a statement by the Council on Medical Education some weeks ago regarding medical education in the United States, the public through the public press is expressing its approval and giving its support to the reforms therein advised. This cooperation of the public is wise and necessary for the adoption and enforcement of higher medical standards.—**CONTROL OF MEDICAL EDUCATION IN NEW YORK:** This is almost completely in the hands of the Board of Regents and so rests on a nonpolitical basis. The Regents not only fix the standards for preliminary and medical education but also conduct examinations for the same. The Board of Examiners which furnishes the questions and grades the answers of the examinations for licence to practise medicine is under the complete control of the Board of Regents. A new law recently passed now gives the Regents authority to prosecute violations of the medical practice act. New York is to be congratulated on its nonpolitical system of control over all departments of education.—**STATE BOARD EXAMINATIONS AND MEDICAL EDUCATION:** State board examinations not only ascertain the fitness of candidates to practise medicine but also can furnish a most effective stimulus to the improvement of medical education. To accomplish the latter they must be such as will differentiate sharply between real, effective, assimilated knowledge and the superficial pseudoknowledge procurable by memorizing quiz compends. This could be done by adding to the usual oral and written examinations a practical portion. This has been tried with success to some extent in Germany and France.—**MEDICAL**

**EDUCATION IN THE UNITED STATES:** The statistics on medical education for the year in the United States have recently been published. Decided advances have been made along all lines. Many new buildings, laboratories and hospitals have been built, some 40 colleges have voluntarily raised the standard of entrance requirements, and in all sections of the country the desire for higher standards has been manifested. The establishment of two night schools is to be regretted. From the tables it will be seen that New York, Illinois and Pennsylvania each contribute more than 2,000 students. The total number of students, 24,276, shows a decrease of 928 below that of 1906. The total number of graduates, 4,980, is a decrease of 384 below that of 1906. During the year five medical colleges have ceased to exist and five new ones have been established, making the number the same as for last year, 161.—**MECHANICAL PRESCRIBING IN HOSPITALS AND DISPENSARIES:** The use of formularies and ready-made mixtures in clinics, dispensaries and hospitals connected with medical schools, is to be deplored as it generally leads to the use of nostrums and specifics in the treatment of disease. It is especially undesirable in the teaching of students where the underlying principles should always be kept in view and their intelligent application in detail carefully taught.—**THE ANNUAL FOURTH OF JULY SLAUGHTER:** In 1903 when the first collection of statistics on this subject was made the number of deaths was 466, of which 406 were due to tetanus. This has steadily decreased until for this year we have the lowest number yet recorded, 73. This decrease is due to two causes, one being a popular understanding of the grave danger that lies in blank cartridge and other Fourth of July wounds, and the other is the more thorough surgical treatment of these wounds and the frequent prophylactic use of antitoxin. The medical profession has done its part and now the public should insist on protecting itself by the proper enforcement of laws prohibiting the use of fire arms and large cannon crackers.—**SANITATION AND POPULATION:** It is generally recognized that the birth-rate in civilized countries has fallen and so any increase in population must be due to a lower death rate consequent on sanitary improvement. This is borne out by the statistics of all civilized countries, in nearly all of which there has been a marked increase in population in the last half century. In the statistics of the racial elements of the population in Europe

the Teutonic people have about held their own, the Latins have decreased and the Slav now represents the most important factor, in the population. This same change is gradually taking place in our American people.—**STAPHYLOMYCOSIS:** Otten has recently given an extensive résumé of the medical aspect of staphylococcus infection, or staphylococcosis, based on 55 cases observed in the clinic of Lenhartz. He brings out the fact that sepsis in about 5 percent of cases originates in healthy persons from boils, paronychias, and superficial skin wounds. Infections from mucous membranes, especially from the urinary tract and the puerperal uterus were next in importance while osteomyelitis was a fairly frequent source. The common idea that *Staphylococcus aureus* is more virulent than *Staphylococcus albus* is not borne out. About 80 percent of the patients succumb to the infection. About 25 percent of the patients develop endocarditis. The treatment for this form of sepsis is as yet unsatisfactory though some hope may lie in bacterial vaccination. This study emphasizes the great value of the systematic examination of cultures from the blood, spinal fluid and pus in reaching a diagnosis.—**STREET ACCIDENTS:** Many physicians in large cities are in the habit of ignoring the crowds on street corners which tell of the presence of a victim of some accident or sudden illness, on the ground that he has no means with him for treating such cases and that the arrival of the ambulance would give him no time for their use if he had. It occasionally happens, however, that the intelligent application of a tourniquet or digital pressure, or the immediate use of artificial respiration might be the means of saving life. In any case the physician can often do much to make the patient more comfortable and stop the senseless and often harmful efforts of the volunteer helpers.—**THE VIBRATING SENSATION IN DIAGNOSIS:** Among the new tests which have been used in Europe for some time but not especially noted in this country is the so-called vibrating sensation, sometimes spoken of as "bone sensibility" or as "pallesthesia," terms given to the peculiar vibrating sensation felt by normal individuals if the foot of a tuning fork of a certain size is placed over subcutaneous bony prominences or surfaces. Its particular value seems to rest in the fact that the vibrating sensation is often lost before changes in the ordinary sensibility can be made out. It is therefore to be employed in the early stages of certain diseases accompanied by loss of cuta-

neous sensibility, in early tabes or peripheral neuritis, in beginning paraplegia from spinal caries, in spinal syphilis, and in the differentiation of organic and hysterical hemianesthesia.—**MORPHIN AND THE ALIMENTARY CANAL:** The action of morphin on the motor function of the alimentary canal has long been a disputed point. Magnus in attempting to harmonize some of the contradictory ideas previously advanced on this subject, has shown that in cats the sympathetic system is not a necessary factor in the action of morphin, that under the influence of morphin there is a stasis of food in the fundus of the stomach, that in the small intestines a stimulating action was produced by moderate doses while very large doses slowed or stopped peristaltic movements. There seems to be little or no influence of the drug on the large intestines. These experiments suggest that the constipation caused by morphin is the result of the retention of food in the stomach. To what extent these observations can be applied to the human subject remains to be demonstrated.—**ALASKA AS A HEALTH RESORT:** The experience of the army would seem to indicate that Alaska is a remarkably healthy country. The sick rate among the troops stationed there has been uniformly low, not at any time more than two-thirds of the rate in the United States. Since 1904 there has been but one case of typhoid and but four cases of malaria, all of the latter probably contracted before going to Alaska. Pneumonia is practically absent. On the other hand, venereal diseases, alcoholism and tuberculosis have given higher rates than in the United States, due probably to the long, dark winters, the close confinement and imperfect ventilation.

**Boston Medical and Surgical Journal.**—**LABORATORIES IN THE MEDICAL CLINIC:** A few years ago the equipment of a clinical laboratory was quite simple but with the advent of bacteriology and its attendant methods of serum diagnosis a more extensive laboratory technic was brought into routine usage. The attempt to meet these increasing demands has been made through the pathological laboratory with its subsidiary departments. In this way much valuable work has been done but there has been a gap between the clinic and the laboratory, due to the fact that the pathologist is not a clinician. The tendency in America now is for a laboratory of clinical medicines, directed by a head primarily a clinician, dominated by the problems of the clinic, peopled by those in training for clinical work and having the aid of men especially trained in chemis-

try, biology and physics.—**FEES FOR LIFE INSURANCE EXAMINATION:** During the recent investigations many of the insurance companies reduced the fee for medical examinations, claiming that such action was necessitated by the strong demand for economy. At the end of six months' trial as the result of the organized resistance of the medical profession throughout the country, led by the American Medical Association, together with the fact that the insurance companies due to their enforced economy had a small surplus, the fee of five dollars for examinations has been restored in two of the three large New York life insurance companies, the Mutual Life and the Equitable. Such an action is gratifying and one which medical men serving in the capacity of examiners have a most legitimate right to demand.—**THE PROGNOSIS AND THERAPEUTIC MEASURES IN CHEYNE-STOKES RESPIRATION OCCURRING IN THE NEPHRITIDES:** The prognostic value of Cheyne-Stokes respiration in the various nephritides is very variable. This variance is due to productive lesions and the prognosis should be made with a knowledge of these causes. So long as the heart muscle preserves its anatomical integrity Cheyne-Stokes respiration may be made to disappear, at least for a time. When, however, cardiac insufficiency develops, serious symptoms appear, including this particular phenomenon, and death soon occurs. Digitalis is indicated in those cases of Cheyne-Stokes respiration due to functional cardiac disturbances or to general arteriosclerosis, but in which the cardiac muscle is not pathologically changed. If, however, there is a coincidence of cardiac and arteriosclerotic lesions the use of morphine becomes the one of choice.—**THE QUESTION OF SPONTANEOUS GENERATION:** This subject has again been revived by a recent publication of Bastian's, who 30 years ago was in dispute with Tyndall and Pasteur over the origin of living matter. Bastian maintains his views previously expressed with unaltered firmness. He regards the production of living matter as a continuous series of evolutionary results, and believes that the genesis of living matter is continually going on as it has been for ages past. To this process the general term "archebiosis" is given. It is not to be expected that this view will be immediately accepted by men of science, but renewed agitation will be of benefit and will lead ultimately to the exact facts. It is also of interest to the practical physician to determine the conditions which may render possible the production of the causative agents of infec-

tions and contagious diseases.—**AMERICAN PHYSICIANS IN GERMANY:** The kindness shown American physicians by German professors has been and is proverbial and the American appreciation of German medicine is widespread. The habit of Americans of attending lectures or clinics without first asking permission, however, is not courteous and often occasions a financial loss to the instructor whose own registered students are turned away because their places have been filled by medical travelers.—**HEMORRHAGIC INFARCT OF THE INTESTINE:** Hemorrhagic infarct of the intestine, when of venous origin, is usually due to a thrombophlebitis of the mesenteric veins, and affects usually the small intestine. The symptoms begin with sudden, violent abdominal pain, vomiting, and diarrhea, soon to be followed by symptoms of occlusion. Death is the final outcome if the patient is not radically treated. Laparotomy with resection of the diseased intestinal coil seems to be the only treatment. The condition is infrequent but two cases have been recorded, cured by early operation.—**DEATHS BY LIGHTNING:** According to data collected by the Weather Bureau 800 people are killed in the United States each year by lightning. Florida and parts of Georgia and Alabama experience the greatest number of thunderstorms yearly. Four times as many persons of outdoor pursuit as of indoor occupations are struck. Of those struck, one in every three persons survive. More than half the persons killed by lightning are those who have taken refuge under trees. Lightning, therefore, as a cause of death is not negligible.

**Medical Record.**—**KERNIG'S SIGN IN CEREBROSPINAL MENINGITIS:** The opinions of the value of Kernig's sign in the diagnosing of cerebrospinal meningitis have been varied. Kernig, in a recent discussion of its value, claims that the proper technic consists in having the patient in a sitting position with the trunk and thighs of the patient so supported that they are constantly at right angles, and considers that his sign is elicited if the extension of the leg upon the thigh proves to be impossible in this position. He refers to Roglet's theory as to its causation, that the increased cranial pressure and the irritation of the roots of the spinal nerves by the exudate produce a hyper-tonic condition of the muscles of the legs. The sign, therefore, disappears with the onset of paralysis and diminishes after spinal puncture. This discussion should reawaken interest in the sign and lead to a careful reconsideration of its value.—**THE NATURE OF ADDISON'S**

**DISEASE:** Kohn has discovered what he calls chromaffine cells (because of their property of elective staining by means of the salts of chromic acid) in the adrenal bodies and in the sympathetic ganglia, which are thought to contain the active principle of the adrenals. Wiesel believes that Addison's disease is a primary affection of the chromaffine system and may begin either in the adrenals or in the sympathetic system. Grawitz, however, expresses the opinion that the disease may result from chronic intoxication originating in the alimentary canal. In corroboration of this theory he reports two cases of Addison's disease which were cured by gastric lavage and carefully regulated diet.—**THE PHYSICAL CONDITION OF WEST POINT GRADUATES:** Contrary to the widespread impression among physicians and laymen that the physical and nervous condition of West Point cadets is about perfect comes the recently expressed opinion that the training at West Point is too strenuous for immature bodies and that the hours set aside for sleep are insufficient. This should be investigated by the proper medical officers and if found to be true properly remedied.—**PREVENTION OF POSTOPERATIVE THROMBOSIS:** Once established, little can be done for the relief of thrombosis so that our main hope lies in prophylaxis. Witzel bases his treatment upon the general causes of intravascular coagulation. He calls attention to the importance of good hemostasis, as little handling of tissue as possible and asepsis in operations; the maintenance of a good cardiac action by stimulants if necessary and proper heat about the patient, and the securing of a good venous circulation by deep inspiration exercises, by getting patients out of bed as soon as possible after operation and by the early use of cathartics.—**CONCERNING PLAGUE:** Plague shows no signs of decline in the Far East. Simpson, of London, in a recent series of lectures states that the prevention of plague in India is the most important question for India and England at the present time. In discussing its dissemination he says that while rats are thought to be the chief agents in the spread of the disease, the manner of its transference from the rat to man is still in doubt. Thompson, of Sidney, supports Simond's theory that the flea from the rat dead of plague, biting man effects the transference. Simpson on the other hand believes that the transmission is brought about by food infected by the rat.—**THE BEARING OF ANAPHYLAXIS ON THE ANTITOXIN TREATMENT OF DIPHTHERIA:** The term, anaphylaxis is used to designate the increased sus-

ceptibility to a poison exhibited by an animal which has survived a nonfatal dose of the same substance. The phenomenon was first noted in guinea-pigs treated with several injections of diphtheria antitoxin where the fatal reaction was shown to be due not to the antitoxin but to the anaphylactic influence of the horse serum containing the antitoxin. The anaphylactic action of normal serums occurs, however, according to Pfeiffer, only in case the serums are hemolytic for the injected animal. Whether horse serum is hemolytic for man is not definitely settled. The importance of determining this point and of determining the dose necessary to produce toxic effects is evident.—**BLOOD INJECTIONS IN CANCER:** Professor Bier has found that after injections of sterile defibrinated heterologous blood into the human subcutaneous or other tissues, there occurs a local inflammatory and a febrile reaction. That through the hemolytic properties acquired by the first injection, subsequent injections are not apt to be followed by an increase in the intensity of the reaction. The heterologous blood appears to have no solvent action on normal tissues but pathological structures, notably carcinomatous masses, are profoundly modified. He reports two cases treated in this way; in one there appeared a destruction of the cancer cells though the violent inflammatory reaction with the formation of new connective tissue and in the other a massive dry necrosis of the tumor mass took place. A word of caution as to indiscriminate attempts to apply this method before its dangers are known is necessary.—**RÖNTGEN RAY DIAGNOSIS OF POSTPNEUMONIC CONDITIONS:** Jürgens in a recent article has shown how with the aid of a series of röntgen-ray pictures of the lungs, a differential diagnosis may be made more exact between delayed resolution after pneumonia, carnification, tuberculosis, abscess and gangrene. The röntgen-ray pictures are especially helpful in differentiating between the first three of these conditions. In regard to the last two the skiagraph not only verifies the diagnosis but often shows us that the process is in a state of repair before any changes can be detected in the clinical symptoms. This method of diagnosis is to be used of course in conjunction with the clinical symptoms and history of the case.—**THYMUS GLAND TREATMENT OF CANCER:** Gwyer has tried the thymus gland as a therapeutic agent for patients with cancer. On account of the disintegration of the pathological tissue brought about by its use free elimination must be kept up during the treatment. Gwyer's work is so

recent that the value of this treatment is still unsettled. However, in the case reported, local improvement took place, the pain was diminished or abolished and the cancer process was arrested, or the size of the growth diminished; in some cases the general condition of the patient improved.—**THE MALARIAL PARASITES:** Plehn has recently reiterated the old opinion that the three typical forms of malarial parasites, the tertian, quartan and estivoautumnal, represent only variants of a single type and that the change from one to another is brought about by changed climatic conditions. He states that the estivoautumnal type is found in the tropics and becomes changed to one of the other two types in the temperate latitude.—**THE PRACTICAL SIGNIFICANCE OF THE WALCHER POSITION DURING LABOR:** Lange has recently emphasized the usefulness of the Walcher position in cases of difficult labor. He has found that the greatest difference in the length of the diagonal conjugate between strong flexion of the thighs and absolute hyperextension amounted to 0.8 to 1 cm. The position is indicated whenever there is a disproportion between the head and pelvis, or in cases in which after the head is delivered broad shoulders make trouble. Sellheim uses it in forceps cases and in primipara when the perineum looks as if it were going to tear. The Walcher position is taken advantage of far too seldom.

**New York Medical Journal.**—**THE MORBID ANATOMY OF MENTAL CONFUSION:** The postpuerperal psychoses are now generally held to be due to intoxication or infection with the interposition of some excitement or mental shock. Two pathological factors may be recognized in these cases. One is constant and this is the presence of toxic elements in the organism; the other is accessory and consists in a local swelling of the cortical cells of the cerebrum, the projection of their nuclei to the periphery and the disappearance of chromatin granules. If the intoxication or infection is recent and removable and the degenerative process in the cortex not far advanced, recovery of the mental condition may be reasonably expected after surgical intervention. Attention and careful study should therefore be given these cases of pelvic disease associated with insanity.—**THE DOMESTIC FLY:** Of the fly's part in the transmission of typhoid fever and many other diseases there can be no doubt, so that every effort possible should be made to bring about its extermination. The banishment of abattoirs and stables from metropolitan communities

would strike at the root of the problem, as both offer excellent opportunities for breeding flies in large numbers. The screening of dwellings and food, and the maintenance of strict cleanliness, especially about kitchens, will do much to limit their influence in the transmission of disease.—**INFANTILE PARALYSIS AND RECUMBENCY:** Judson, of New York, would prevent the deformity after infantile paralysis by insisting on recumbency during the period of recession. The opposition on the part of the patient's friends could be moderated by the continuance of such measures as passive motion, resistance exercises, electricity, massage, local applications and judicious medication.—**THE CHEWING OF GUM:** Although the habit of gum chewing is disgusting we must conclude that it is hygienically beneficial. Not only does it tend to cleanse the teeth but it also aids in digestion, according to Meunier who perceives a "supplementary insalivation within the stomach" as the result of the habit.—**TYPHOID FEVER IN THE DISTRICT OF COLUMBIA:** After a study of the typhoid fever epidemic in the District of Columbia, the board recommends the permanent closure of all shallow wells in the District on account of their general pollution with sewage. Although direct evidence of the presence of *Bacillus typhosus* in the water of the Potomac river could not be found a number of indications point to this water as the chief agency in prolonging the disease. The board therefore recommends the enforcement of the streams pollution act. The sand filters were found to represent a high degree of engineering skill and intelligent management. The milk supply, to which, however, only ten percent of cases could be traced, was severely criticized. The most important prophylactic measure is the destruction of the organism as it leaves the body.—**BACTERIA IN ICE:** While the investigations of the artificial ice supply in the District of Columbia indicate that ice played no important part in the dissemination of typhoid fever in the recent epidemic they did reveal a serious sanitary defect in its manufacture. Out of 28 specimens of artificial ice 28.6 percent showed contamination with *Bacillus coli communis*. The manufactured ice examined contained more bacteria than the water from which it was frozen, thus giving evidence of unclean methods in its manufacture.—**THE RUBBER TEAT AND ITS DUMMY:** Wende showed several years ago that however well cleaned, the rubber teat soon teemed with microorganisms and so acted as a cause for gastrointestinal disease.

Dr. Pedley in a recent article adds to this danger the tendency to certain deformities of the alveolar processes which predisposes the child to dental disease and perhaps to adenoid growths in the pharynx and also to an irregular formation of the hard palate. He ascribes these results to the faulty shape of the teat, whereby the child is forced to suck its milk instead of squeezing it into its mouth as it does from the mother's breast and suggests as a substitute for the teat the end of a rubber finger, but also adds that a baby three months old can quite easily be taught to drink from a cup. The trouble wrought by the rubber teat is furthered and continued by the use of its dummy, the baby "comforter" or "pacifier."—**SCHISTOSOMUM INFECTION:** There are now supposed to be two types of this parasite; one, *Schistosomum hamatobium*, infecting the genitourinary tract and producing ovums with an apical spine, and the other, *Schistosomum mansoni*, infecting the intestinal tract and producing ovums with a lateral spine. Holcomb has recently reported ten cases of infection with this second type of parasite occurring in the West Indies and gives a description of the male parasite which differs from the *Schistosomum hamatobium* in some particulars, especially in its smaller size.—**THE SILICATES IN DYSPEPSIA:** In a recent communication Pascault discusses the therapeutic properties of the silicates, particularly sodium silicate, which he describes as a sedative and an antizymotic. It prevents the fermentation of milk in the stomach and corrects the fetor of the breath and of the feces. It is particularly of service in dyspepsia through its influence on gastric "hypersthenia."—**DENGUE:** From a communication of the Army Board for the study of "tropical diseases as they occur in the Philippines" there seems now good evidence for the belief that the etiological factor of dengue is not a bacterium nor a blood parasite at least detectable by our present methods of examination. The infective agent does seem, however, to reside in the blood and to be ultramicroscopic in size. Experiments with *Culex fatigans*, the mosquito suggested by Graham in 1903 as being responsible for the transmission of the disease, seem to show that the parasite of dengue does not undergo any cycle of development in the body of the mosquito, that it lives in the stomach of the insect for an indefinite time and is introduced into man by regurgitation through the esophagus and proboscis during the act of biting. This latter statement is criticised and it is suggested that the transmission is more likely effected by the soiling of the pro-

boscis as is the case in trypanosome transmission.—**THE PATHOLOGY OF DROPSY DUE TO VENOUS OBSTRUCTION:** According to Bolton whenever for any reason the free flow of blood into the heart is prevented, there is a general rise of venous pressure in all the veins of the body, extending as far back as the capillaries, accompanied by a fall of the mean arterial pressure. The venous and the arterial pressure return more or less completely to normal and a few hours later dropsy occurs at a time when the capillary pressure is normal or even below normal. The author concludes, therefore, that dropsy is the result of an altered condition of the vessel walls, the change of pressure being merely a concomitant circumstance or at most a contributory factor.—**A NOVELTY IN OBSTETRICAL MECHANICS:** Dr. A. E. A. King, of Washington, has urged the efficiency of the squatting posture as an aid to external version in cases of transverse presentation. He bases his idea on the fact that in the asymmetrical position in squatting with one foot in advance of the other the pressure in the abdomen is very great on the part of the thigh corresponding to the posterior foot. So that if the child's head lies on that side it is almost sure to be forced up and the presentation be converted into one of the breech. Dr. King has his patients kneel only on that knee corresponding with the side to which the child's head is directed. The position is too undignified as a routine procedure and may be imitated with the patient lying on her back by forced flexion of the thigh on the abdomen.—**CHRONIC CARRIERS OF TYPHOID FEVER:** Kayser, Conradi and Müller have shown that the typhoid organism may persist for a considerable length of time in the human body after an attack of typhoid fever, so that the excreta of such persons may be the means of infecting other individuals. Kayser has recently examined the feces and urine of 101 patients in Strassburg who had had the fever previously and of these three still harbored the organism. Hence he proposes that the urine and feces of all patients who have had typhoid fever be examined at least several months after their convalescence and that chronic carriers be subjected to special supervision.—**THYROID EXTRACT IN INCONTINENCE OF URINE:** In a discussion of the functions of the thyroid body as recently published by Hertoghe, the suggestion is made that nocturnal incontinence of urine in young children and adolescents is due to thyroid impoverishment. Hertoghe, therefore, recommends the administration of thyroid extract in this condition,

and with the extract he associates potassium iodid and potassium bromid.

## NEWS AND NOTES.

**The International Congress of Physiotherapy.**—The Committee of the Congress to be held in Rome next October for the consideration of physical remedies in the treatment of diseases have arranged special transit facilities for members of the Congress and their families with the following companies: Società veneziana di navigazione a vapore, La Veloce, Lloyd Italiano, Navigazione generale Italiano. The last named have agreed to a reduction of 30 to 50 percent. The advantages proffered by the other companies can be learned through any transportation agency. The Committee have also concluded an especially favorable tariff for their visitors at the best hotels in Rome and other Italian cities to which excursions will be arranged at very reduced rates. The secretary of the Congress is Professor Colombo, Via Plinio, Rome.

**Probability of Death from Cancer.**—Sir William Church, ex-president of the Royal College of Physicians, is of opinion that the probability of dying from cancer was now 1 in 12 for all men above 35 years, and 1 in 8 for all women above that age, as contrasted with 1 in 21 and 1 in 12 twenty years ago.

**The Extermination of Mosquitos in Brazil.**—Between 1872 and 1902 the total mortality from yellow fever at Rio was seldom less than 800, and was often over 2,000, and even 4,000. The extermination of the mosquito undertaken by "brigades," under the command of Senhor de Oliveira Borges, in 1903-4 reduced the mortality to 48, and in 1906 it was only 42. Yellow fever has now, it is stated, ceased to be endemic or epidemic. Equally satisfactory results were obtained in ships in the port.

**The epidemic of infantile paralysis in New York** is assuming alarming proportions according to the reports of the hospitals, who have the disease under observation in the hope of discovering the germ which is supposed to be responsible for the infection. There are now under treatment in various hospitals between 350 and 400 children who have the disease well developed and most of whom will be hopeless cripples for the rest of their lives. There are 75 cases under observation by the staff of the hospital at the New York Society for the relief of ruptured and crippled, at

Forty-second street and Lexington avenue. In two weeks 50 children affected with paralysis were carried to the institution by their parents. The work of the hospital men has been materially hampered by the fact that 99 per cent of the cases are brought to their notice from ten days to two weeks after the inception of the disease. This makes it impossible for the men of the laboratories to get at the disease when chances for locating the supposed germ are greatest.

**A New Test for Blood.**—According to Schilling traces of blood in a fluid can be recognized by the addition of a few drops of a 20 percent solution of hydrogen dioxide. The blood promptly decomposes the reagent, and shows its presence by means of the production of numerous small bubbles of oxygen, while the solution is decolorized. The test is said to be positive if blood is present in the proportion of 1 to 1600.

**Yellow Fever in Cuba.**—Dispatches from Havana say the outbreak of yellow fever in the American garrison at Cienfuegos is much graver than was first thought. Eight new cases, making a total of ten, have so far been reported. The utmost care is being taken to prevent the fever spreading to the remainder of the garrison.

**Epidemic Caused by Impure Milk.**—In San Antonio hundreds of people, mostly children, are reported to be ill from drinking impure milk. This has caused the city Board of Health to start an active investigation of the milk supply. Over 800 complaints are filed against one dairy. Analyses conducted by the city bacteriologist show the milk to be of dangerous quality.

**Dengue Fever at Monterey.**—On his return from a trip to Monterey, Mexico, State Health Officer Brumby reports 800 cases of dengue fever at that place, and that the authorities are doing nothing whatever to check it. He is of the opinion that the dengue recently developed at Brownsville found its origin at Monterey. He says Texas has a rigid quarantine in operation against Monterey, and with a little more precaution the disease will not spread in Texas. He urges that war be waged on the mosquito.

**Hints on Tuberculosis.**—The New York Health Department has had printed a million circulars, more than 60,000 of which are in the form of a catechism for the use of school children, on tuberculosis. The remainder are small pocket cards, printed in red and black, in English, German, Italian, Swedish and Yid-

dish, and designed for the instruction of the public in general. These cards are sent all requesting them, to manufacturers, merchants, to all members of the police and street cleaning forces, to the State National Guard, and to such large employers as the Metropolitan and the Interborough Street Railway Company.

**Lack of milk in New York** is attributed by some to the long drought this summer, which has spoiled fodder and reduced the ordinary output of the dairy farms, but that with returning rains this difficulty will be obviated. Others say that a more far-reaching and permanent cause is the increased demands made upon the farmers by the Board of Health of the city. This has led to considerable outlay on the part of farmers and led not a few to decide not to send any more milk to New York, but to sell it upstate to the creameries and cheese factories, where the exactions are not so strict.

**Liquor Causes Army Ills.**—Major General Frederick D. Grant, commanding the Department of the East, in his annual report says he is convinced that the causes of the offenses of officers and men which necessitate their being disciplined are nearly always to be found in the use of intoxicants or drugs. The five posts where the men were the healthiest were Forts Dupont, Niagara, Michie, Ontario and Hamilton, while the five posts where there was most sickness were Forts Washington, Wadsworth, Myer, Ethan Allen and Howard.

**Milk and Typhoid.**—Five of the 21 cases of typhoid fever in the city of Harrisburg last month have been traced to a dairy in Susquehanna township, just a little north of town, which supplies the city with considerable milk. That is the finding of the Sanitary Committee. Only two of the 21 cases have been traced to water, the rest having originated in other ways.

**Plan to Burn Hospital.**—Destruction of the old city and county hospital by fire has been recommended to the San Francisco Supervisors by the Board of Health. This action was taken as a means to obviate a possible spread of bubonic plague, many cases of which were taken there. About this hospital, a collection of frame buildings, many stories have been told. Time and again physicians in charge have declared the buildings menaces to the health of patients. Innumerable charges of graft against various city officials have emanated from them. At the time of the earthquake, when the fire made necessary

abandonment of Mechanics' Pavilion as a temporary hospital, the inadequacy of the old city and county hospital was shown. In fact, it generally has been regarded as little better than a pest house, situated as it is on the outskirts of the city. Announcement that the Marine Hospital Service is to take charge of the plague situation is regarded as an assurance that the progress of the disease will be stopped in short order.

**A Typhoid Fever Carrier.**—Biggs reported at a meeting of the Practitioners' Society of New York a series of outbreaks of typhoid fever apparently caused by the dissemination of the bacilli by an apparently healthy subject. Outbreaks of the fever had occurred in four families in the vicinity during the past four and a half years, and in each instance the outbreak had occurred shortly after the employment of a certain woman as cook. An investigation was instituted which disclosed that in addition to these four families, typhoid fever had occurred in several other families where she had been employed in the same capacity. The woman was found and forcibly taken to the reception hospital, where she was detained. At one time nearly 90 percent of the organisms found in the feces were typhoid bacilli. The woman gave no definite history of typhoid fever, at least not for the previous five years.

**A Bean in the Ear for Many Years.**—Herzig (*Am. Journ. Surgery*) reports a case in which a bean was found in the ear which had apparently been there for many years. The patient, a boy of 13 years, was brought to him suffering from severe earache. The author, on examination, concluded that the trouble was due to impacted cerumen, but on proceeding to remove the obstruction brought away almost the entire shell of a bean. The child had been generally healthy. About the age of two years he complained of pain in his ear, which was relieved. The father stated that the child had not heard well since he was two years old, but no discharge from the ear or other symptoms occurred until the severe earache mentioned. The child had no recollection of putting a bean in his ear.

**The systematic medical inspection** of the pupils of the public schools of Dayton, O., which will be inaugurated this fall under the direction of the Montgomery County Medical Society, will be done by a corps of 24 physicians, one to each school building. In Cincinnati each medical inspector has three or four schools under his charge.

**Concerning rabies** the Illinois law provides that all poor persons bitten by a rabid animal, or otherwise put in danger of infection with rabies, shall be sent to an institution for its cure, the expense of treatment, \$100, to be borne by the State. The county in which the victim resides is required to pay his transportation to and from the institution, with attendants. This most humane law is a most necessary one, and yet, strange to relate, only three States in the entire union have such a measure, namely, Illinois, New York and Ohio.

**The medical experts in the courts of law** in the State of Maine will no longer represent the counsel who employs them if the Maine bill (originated by the Chief Justice of that State) becomes a law. The bill provides that the experts thus selected shall be paid by the State, and the amount of their compensation is to be fixed by the judge who tries the case.

**Dr. Peter Beaugrand**, Sandusky county's (O.) oldest physician and surgeon, celebrated August 26 his ninety-third birthday anniversary. Born in Detroit in 1814, and coming to Fremont when but a young boy, he became associated with much of the earlier history and affairs of the town. He began the practice of medicine in 1833 and was surgeon of the One Hundred and Sixty-ninth Ohio Regiment during the Civil War.

**Deathrate Higher in New Jersey.**—New Jersey's deathrate has been above the average in August, a total of 3,232 deaths having been reported to the State Board of Health, as against 2,920, the average of the 12 preceding months. The greatest fatality prevailed among the children, there being 1,066 deaths among infants of under one year. Infantile diarrhea was the most deadly disease, having caused 689 deaths. Diseases of the nervous system caused 372 deaths. Tuberculosis of the lungs killed 258, while 51 died from tuberculosis of other organs. One hundred and thirty persons died from cancer. Twenty-three persons committed suicide. August is regarded as the greatest suicide month in the year, but it failed this season to keep up with the records of some previous summers.

**A new way of preserving meat has been discovered** by Professor Lapparant of Paris. It is hung up in a tight box, and then a few sulfur threads are burned in it, after which the box is closed. The meat will be preserved longer than is necessary in house-keeping, and its taste is not at all affected.

# American Medicine

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The scandal of expert testimony has again occupied the attention of the whole civilized world to the shame and confusion of the medical profession. There may have been a time when the present system of submitting more or less expert opinions to the jury as an aid to the interpretation of facts, may have served the purposes of justice fairly well. Yet it is fundamentally wrong, as the experts are hired by the interested parties instead of being impartial servants of the court, independent of either plaintiff or defendant. Lawyers have cynically remarked that they can buy any kind of an expert opinion they want, and they doubtless reflect a widespread popular idea that if the fee is big enough it moulds the opinion of the expert. This impression is a gross injustice to the great body of honorable men who have always formed their opinions from the facts. Nevertheless, the cases in which the popular impression appears to be well founded are so numerous, that they taint all the rest. If the expert witnesses of the two sides had sense enough to get together and discuss a case they would not differ so often. The profession owes it to itself to end the wretched system which has really died already in that it has outlived its usefulness. The decaying carcass smells to heaven. Disinfection is not enough. Burial is needed.

The jury must remain the judges of fact for that is the foundation of the democratic liberties of Anglo-Saxons. We de-

mand that our causes be decided by our peers, not by those in authority over us nor by those beneath us, but by those who think as we think and do as we do, and who can best interpret our acts. The jury must be given the exact facts and when necessary the impartial opinions of learned men to help them understand the facts. Opposing experts mutually destroy the value of their opinions and defeat justice. The jury is left to decide for itself like tossing up a penny—some one way, some the other. Not only is society injured by the acquittal of the guilty but there is the more horrible possibility of unjust convictions resulting from the opinions of the experts of the prosecution as in the Guiteau case. Experts have enormous influence. It is not true that the Thaw jurors "paid no attention to the alienists" for several were convinced that the accused was insane and the rest were convinced by the other alienists that he was not insane.

**Impartial opinions are now demanded** by the very abuses of partisanship. From all over the world there are suggestions of plans to remove the expert from the influence of either side. The general opinion seems to be in the direction of a commission selected by the court but subject to objection by either side. The last suggestion, in cases of criminal insanity, is to have a permanent board of alienists, appointed by the supreme court after recommendation by some medical association. From this

board, a commission acceptable to each side will be selected to examine into the case and report its findings to the jury. There will still be differences of opinion, for that will be human, but there will be no suspicion of bias or dishonesty. In every trial needing expert advice—surgical, medical, engineering or any other, a similar procedure is demanded. The details can be worked out by the bar and scientific associations. The matter must be taken up at once, for the scandal is making a mockery of skill and learning.

**Hired experts will always be used by both prosecution and defense**, as a matter of necessity to assist in preparing the case, but they must not be permitted on the stand as witnesses. There is no reason why they should not be recognized as assistants to the attorneys. The accused is entitled to it as a right, or we will revert to the dark ages when he was presumed to be guilty, forbidden an attorney and then hanged. It should be as ethical for the doctor as for the lawyers. Such an expert would be recognized as an advocate, but if he is a witness he must have no connection with either side, and be as impartial as the judge and jury. No one doubts the fairness of a judge because he was once an advocate, nor would an expert witness be tainted because he was a hired assistant to the attorney in some previous case.

**The distinction between legal and medical insanity** has occasioned a great deal of comment among lawyers and doctors. It is one of the numerous points raised by the Thaw trial. Laymen have absorbed some very ridiculous notions on the subject and it does seem that there is need of a revision of definitions. In the first place, no two minds are alike, and it is manifestly absurd to consider these variations as evidence

of disease. Even those congenital variations which are so far from the average as to be called abnormal, and which lead to the commission of crimes, cannot possibly be classed as insanity—a disease. Every criminal is abnormal, and if he is rich, it is possible to obtain “expert” opinions that the abnormalities are evidence of mental disease and not evidence of a mental make up which unfits the possessor for liberty. If the insanity plea is to be accepted in the case of abnormal men, we will empty the prisons.

**The term legal insanity** seems to be taking on the popular meaning of a special form of insanity which may or may not be real insanity. It was originally a crude attempt to define responsibility. Courts must have a dividing line, for there can be no legal borderland cases neither guilty or innocent of deliberate wrongdoing. It was first thought that knowledge of right and wrong was proof of responsibility, but many of the irresponsible insane have very clear and correct ideas on the subject. Then came the test of “irresistible impulse” or loss of ability to control one’s self, but that really includes a large percentage if not all the sane criminals and many “abnormals” who are not criminals. The word insanity might properly be restricted to the meaning of actual disease of the brain. The term legal insanity could well be abandoned, for it has created the impression that there are two kinds of mental disease, in one the victim being legally sane though really insane, and in the other insane both legally and medically.

**The half-insane** have been described by Professor J. Grasset, of the University of Montpellier, France, in his book “Démifous et Demi-responsables,” which is merely one of the innumerable attempts to classify the abnormal with the insane. Lombroso

also tried it and has been thoroughly discredited. Genius is allied to insanity only insofar as it sometimes appears in neurotic families, but to call it insanity is a woeful misuse of terms. It has been proved that great intelligence is generally a matter of inheritance. Nearly all of England's great men are born in prominent families already noted for mental ability. The abnormalities of genius are then not signs of insanity at all, but merely evidence of an unusually developed brain. The long list of men of genius classed by Grasset and Lombroso with the insane or degenerate (mattoids) includes the sanest and greatest men that ever lived. They were vastly different from the common herd—abnormal only in that they were far from the average.

**Semiresponsibility** is also asserted by Grasset of these abnormal types and a more dangerous and false doctrine has never been published. These men are sane and fully responsible for their acts. If they become dangerous to others, they must be locked up like other abnormal types, and only when actual insanity does occur are they to be held irresponsible. If Grasset's idea is to be followed to its legitimate conclusion, every man on earth will claim "limited" or "attenuated" responsibility, for every one has some mental characteristic different from all other men. It is time to call a halt to the efforts of those alienists who are apparently trying to break down the safeguards of society. Every man should clearly understand that he must take the consequences of his acts and not play the baby.

**The protection of society from the abnormal man** is the main point for juries to consider. Unfortunately there is a general impression that public safety demands the execution of such irresponsible lunatics as Guiteau, even though their insanity be

self-evident. In the case of lesser crimes of the insane, public opinion will not permit punishment, but it is now beginning to clamor for their restraint for life as unsafe to be at large. The rule already holds as to ordinary criminals considered sane yet who are as irresponsible as Guiteau, in that crime has been forced upon them by circumstances beyond their control—victims of fate, but whether of heredity or environment or both is immaterial. In other words, the proof of insanity may eventually be used to confine the convicted criminal in hospital instead of prison. In the Thaw case, there would not have been a mistrial, if these rules had been operative, for all the 12 jurors would doubtless have favored confinement—if a straight conviction for murder was not possible.

**Temporary insanity and fits of passion** have been confused both honestly and dishonestly. The great blot upon American courts has been the manner in which they have always excused crimes of passion on the plea of temporary insanity. As a rule, the insanities of criminals are incurable. Doubtless there are rare cases of curable insanity in which crimes are committed, though the alleged instantaneous cases are myths of the laity. In the true cases the ever-present danger of recurrence seems to demand confinement as much as in the case of Jesse Pomeroy. There is no mistaking the ordinary acute maniacal outbursts formerly called transitory frenzy, or the purposeless acts of epileptic explosions, though to be sure some of the latter are unrecognized. The sane criminal of passion has a purpose and generally has the one crime against him. As a rule he leads an exemplary life after release from prison. It is proof that he can control himself and would have done so if he had the deterrent fear of pun-

ishment. Too many acquittals in prior cases had weakened his inhibition. That is, our custom of excusing these crimes merely increases their number.

The invention of the term "brain-storm" seems to be a disreputable attempt to revive the old discredited "emotional insanity" or fit of passion. There does not seem to be any alienist who now believes in the existence of a mental disease which disturbs the emotions but not the intellectual and volitional powers at the same time. Yet for many years criminals escaped on "expert" opinions that there was such a disease. The law takes full cognizance of the fact that anger is a normal defense necessary for individual and racial preservation, but it recognizes our ability to restrain it except under extraordinary provocation. Crimes done in "hot-blood" will never cease, but they will never be punished as severely as deliberate offenses. To excuse crimes of passion is the height of folly, and the term "brain-storm" was evidently designed to bring about an acquittal. All normal children have "brain-storms" when crossed, but the memory of a good spanking braces their inhibition satisfactorily. A few judicious hangings for "brain-storm" murders would likewise strengthen the restraints of other weaklings.

**Murder by passion must be checked** or no one will be safe from his enemies—and everyone has enemies. The normal man is in the image of his maker—slow to anger but plenteous in mercy. If he be a savage and quick to anger, he must take the consequences—control by those who are normal civilized men. Weak inhibition allows the emotions to run riot and the law rightly gives such persons into the custody of others. We control children, criminals, the insane and those with child-like mentality—the cases of infantilism or arrested development.

Likewise all others who are unable to control their savage murderous desires must be controlled. If "brain-storm" or "emotional insanity" is introduced as a defense it must be used by the jury as authority for life-long confinement, and as far as the safety of society is concerned it is immaterial whether the jail or asylum be chosen.

The unwritten law demands acquittal for certain crimes of passion. It is a very ancient custom, dating from the time when women were chattels, and it was no doubt necessary. Later it became customary with gentlemen to give the offender a fighting chance for his life—the savage accepted payment. The idea that certain sexual offenses warrant death is thus an ingrained inheritance from remote antiquity—a survival of the savage still in us. Such violence is no longer necessary for the protection of the family for the civilized woman has as much of a share in the matter as the man. She is no longer guarded with a club, but is on guard herself. Our mental evolution has not kept pace, yet there is a rapidly growing public opinion that such crimes of passion must cease and we do not dare to put the unwritten law into the statutes. A few convictions would probably end it. The Thaw jurors sensibly ignored it, but it is painful to read of the judge who praised a jury for following it in the Strothers case.

**The case of Judge Loving in Virginia** deserves the widest publicity. Though there is no evidence that the unwritten law is involved, it is the expected aftermath of the Strothers case. It seems, from the published facts, that Loving committed a cowardly murder on the mere statement of a girl that she had been drugged—a statement which may have been a feminine ruse to conceal a habit of drinking. To clear himself, the murderer must sacrifice his

daughter's reputation—a curious chivalry indeed. If he is freed, it is in the power of any girl to cause the death of any man she dislikes, she need only accuse him of any offense—great or venial—and her relatives will then blow his brains out without giving him a chance to deny.

**Why Not Kill the Girls Also?**—It's just as sensible. As a rule, the women who transgress are not led astray—they are neither seduced nor forced. For the rare cases of violence or seduction, the law is amply deterrent except for negroes and in their case no civilized law seems effective. It is an unhappy fact that fallen women are the female counterpart of the male criminal, and both types spring mostly from respectable families. It's nature's brutal way of cleaning the race of its least moral elements. By survival of the most moral, the standard of morality steadily rises. Modern civilization also holds women responsible for their conduct—they must take the consequences whether for weal or woe. They are emancipated at last and not herded in harems. They need no unwritten laws.

**The difficulty of punishing murder by passion** when the unwritten law is involved is shown by the Thaw and Strothers cases. We seem to be in a transition stage of national evolution in which our personal freedom gives full sway to our inherited instincts unchecked by modern necessities as in older nations. England has few such crimes and punishes them severely as anachronisms. It seems foolish for us to try such cases by present methods. It is a psychological and medical matter in which the profession might interest itself to the public welfare. Reform of legal procedures might result. The lawyers will not do it unless forced, as reforms in all callings come from outside pressure. One Baltimore lawyer has re-

cently won his eightieth murder trial and received congratulations because he never lost a case. Professional pride in saving criminals from punishment stands in the way of protection of society. The present disgrace is more remunerative.

**Legal reforms** depend upon recognition of the psychology of jurors. For instance, the frequent mistrials have created a widespread opinion that a small minority of curiously constituted jurors should not have the power to cause mistrials. This is too revolutionary to be accepted at once, but it is not beyond probability that in time our law will permit a conviction by three-fourths or even two-thirds of a jury if the verdict does not involve execution or confinement of more than twenty years, which is practically a life sentence. A majority might even have power to acquit. If one juror is disabled the rest should constitute a legal quorum.

**The mental exhaustion of jurors** is another serious question raised by the Thaw trial, and it is a very old question which has been repeatedly discussed by physicians. Men taken from their accustomed surroundings, confined in a close, smelly court-room, eating strange foods and having no relaxation, are so often injured in health, that clear thinking is impossible. So often indeed is one disabled outright and a mistrial result that it is suggested that there be two or more extras to act as jurors in the box, but not to vote unless one of the twelve is disabled. This is not nearly so serious as the loss of mental tone of all of them. Trials must be shortened, the hysterical oratory of the attorneys appealing to the emotions must be cut out, extraneous matters excluded from the evidence, and other means taken to preserve the mental freshness of the jury to prevent fool verdicts.

**Spirochætes of mouse cancer** have been observed at the New York State Cancer Laboratory in Buffalo, and reported to the New York State Medical Society, at their January meeting in Albany, by Dr. Harvey R. Gaylord.<sup>1</sup> The organisms are very small and have never been seen before because of the extreme difficulty of staining them; but since their discovery, live, actively moving specimens have been detected. They are from four to six microns long with very closely wound abrupt gyrations of about a half micromillimeter. They are found in large numbers in the connective tissues around the tumors and occasionally among the epithelial cells, surrounded by small vacuoles. There was evidence that the epithelial cells devoured them like phagocytes, and that in this way metastases occurred. Gaylord mentioned other facts which leave no doubt that the cancers and sarcomas are contagious, for they develop in healthy animals confined in cages in which infected animals had previously lived. The long time a cage retains infectivity (three years) shows the long time the organisms can retain vitality.

#### **Classification of Cancer Spirochætes.—**

From the difficulty of infecting one class of epithelial cells with parasites derived from another class, Gaylord thinks that there is a group of numerous species of this new organism. Whether all spirochætes, including those of syphilis and relapsing fever, are protozoa related to the trypanosomes or are protophytes allied to bacteria, has not yet been settled. Observers differ in opinion. It is not said, by-the-way, that such organisms are the cause of human cancer, but merely that they are found in and around mouse cancers, and that these tumors are infective and contagious, but

heredity plays no part in the matter. It does seem as though there has been a real step taken toward the solution of the riddle of cancer. The Buffalo contributions of Gaylord, Roswell Park, H. G. A. Clowes and Professor G. N. Calkins, seem to be the most important advances in the pathology of human cancer for many years.

**The trypsin and amylopsin treatment of human cancer** is in marked contrast to the Buffalo parasitic investigations. John Beard,<sup>1</sup> D. Sc., instructor of embryology in Edinburgh University, has described his work and conclusions in such a dogmatic and egotistic way as to give a very unfavorable impression as to the reality of the things he thinks he has discovered. The lay press has given very much space to his treatment and its remarkable effects. That he has made an addition to our knowledge of cancer no one need doubt, but the proof that a cure has been found or that he has found the cause of cancer is yet to be published. Though a few cures are reported out of many in whom it has been tried, the evidence is not conclusive that the trypsin and amylopsin caused the cure nor that the cases really were cancerous. On the other hand, it is reported that some cases have been made worse, and that other ferments have similar actions on malignant tumors.

**Beard's theory** assumes that in the early divisions of the ovum the cells are not embryonic—that is, they do not form the embryo, but develop an asexual organism, or trophoblast upon which arises the primitive germ cell which then forms the embryo. It is an analogous process to the larval stages of lower organisms. There comes a "critical stage" when the trophoblasts degenerate and disappear through the action of enzymes

<sup>1</sup> N. Y. Med. Rec., Feb. 2, 1907.

<sup>1</sup> New York Medical Record, February 2, 1907.

produced by a primitive pancreas. Normal trophoblasts are destructive, beginning life by eroding the uterine epithelium, eating into the uterus itself to form the placental attachments. If unrestrained they cause chorioepitheliomas, which are often highly malignant. If all the trophoblasts are not destroyed at the "critical period" or if some become included in the embryo, they may take on activity at any later time, but can be destroyed by the enzymes administered in his treatment. It is a very complicated hypothesis which may or may not be true, but it certainly is not proved. Should an infection be proved to be the cause, Beard's hypothesis is, of course, disproved.

**Premature exploitation of medical discoveries** is quite likely to exaggerate their importance, and then when the real facts are realized the remedy is unjustly discredited. Koch's tuberculin was heralded in popular literature as a sure cure and when this was proved incorrect, its real usefulness was forgotten, to the injury, possibly, of many a tuberculous patient. Beard's trypsin treatment might prove to be a parallel case. He claims that unless the amylopsin is also used, the trypsin does not remove or digest the trophoblasts and that some failures are due to this fact. It is also said that some of the enzymes used are inert. The whole subject is now under trial, and it will be months before it will be possible to collect the evidence and render a verdict. In the meantime it is unwise to condemn the hypothesis, or advocate it. Several observers have reported that there does seem to be a cessation or diminution of growth, pain and discharge, and an increase of weight and health, but unhappily there are as yet no reports of cures in America in cases where the diagnosis has been microscopically verified. German reports of the method are

highly favorable, but the English declare it to be a failure. The prophet is without honor in his own country so that the English adverse opinion may really be proof of the opposite.

**Puerperal eclampsia** is said by Beard to be due to toxins excreted by riotous trophoblasts in the placenta and uterine walls, and that the whole pathogeny and train of symptoms are thus readily explained. If true, there is a prospect of discarding all the old methods of treatment which are too often confessedly disappointing. By the proper use of potent enzymes, he claims that the trophoblasts may be destroyed and removed and their toxins neutralized. It is academic, to be sure, and revolutionary, but that is no reason for condemning it. Nor is it evidence of the truth. The matter is too important to be ignored. In time, it will be settled, of course, and in the meantime we should be in a receptive mood—the only mood for a scientific practitioner.

**The transformation of cancer into sarcoma** has been observed by Ehrlich and Apolant<sup>1</sup> during their experiments in transplanting mouse tumors. The unknown cause or X-factor, was transferred to connective-tissue cells after six or more transplantations, and in one case after the fortieth generation the tumors took on the mixed form and in the sixty-eighth, there were pure sarcomas. This would weigh against Beard's theory, as there is no evidence that epithelial are ever transformed to connective-tissue cells. It points to a living infective agent, and suggests the idea that the alleged organisms may cause numerous forms of tumor. Our old classifications are admittedly unsatisfactory and may be abandoned in the near future.

<sup>1</sup>Berl. klin. Wochen., 1905, No. 28, and 1906, No. 2.

**The spontaneous cure of human cancer** has been fully described by Gaylord and Clowes<sup>1</sup> who have collected numerous well-authenticated cases from the literature, in connection with their observations on the spontaneous recovery of mice. Of course, in the majority of the alleged cases of recovery, there is good evidence that some infectious disease has been mistaken for cancer. The authentic cases, taken in connection with the immunity of recovered mice—an immunity which can be transmitted to other mice in the serum—surely brightens the prospects of discovering an antitoxin treatment for man. Again are we apparently on the road of curing a disease which fills every one with terror. Research laboratories are fully justifying their existence. There should be more of them and their workers should be highly paid and numerous. Millionaires, take notice.

**Trauma as a cause of cancer** has been defended by Dr. Wm. H. Dieffenbach,<sup>2</sup> and by trauma he means any injury from violence, pressure, severe inflammations and constant irritations. These in time interfere with nerve supply and as soon as inhibition is removed, riotous abnormal cell growth results. All this is not entirely new, but the new idea suggested is that the facts disprove the parasitic origin of these newgrowths. On the contrary, the toxins due to a parasite might be the very irritation which acts as any other trauma, such as röntgen ray. In other words, there might be numerous causes of cancer—toxins of organisms, excessive light, röntgen rays, senility, or anything which, by mechanical, chemical or actinic irritation, reduces tissue resistance and permits riotous growth of epithelial or endothelial cells or even connective-tissue cells.

<sup>1</sup> Surgery, Gynecol. and Obstetrics, June, 1906.

<sup>2</sup> N. Y. Med. Rec., Dec. 8, 1906.

## BOOK REVIEWS.

**A Manual of Diseases of Nose, Throat and Ear.**—By E. B. GLEASON, M. D., LL. D. W. B. Saunders Company, Philadelphia and London, 1907.

This work fills the scope of its aim in a most satisfactory manner. Intended for the use of undergraduates and those members of the profession who often-times have occasion to seek definite knowledge without extensive reading, the author treats each subject in a manner which cannot help but be pleasing to all who would find an unabridged work confusing. Further, the work is sufficiently comprehensive to render every subject and subdivision complete in itself, even to a point at times not found in larger books—terse-ness being a conspicuous characteristic. There are 262 well-selected engravings, many of them being prepared from the author's original drawings.

**A Text-Book of Sanitary and Applied Chemistry or The Chemistry of Water, Air and Food.**—By E. H. S. BAILEY, Ph. D. New York and London. The Macmillan Company.

The object of this work is to furnish a text-book upon applied chemistry that is suitable for use by those students who have had a course in general chemistry, such as is usually completed in a good high school or in the earlier years of a college course. The best feature of this book is the introduction of experiments which are of such a character as can be performed in any chemical laboratory with a moderate amount of inexpensive apparatus. In Part I there is a discussion of sanitary chemistry, and in Part II is embraced the chemistry of food. The sections on the chemistry of foods are especially interesting at the present time on account of the awakened general interest of the people in pure food. The large amount of general chemical information contained in this practical chemistry makes it a valuable work of reference and its popular style makes it altogether readable. The price is \$1.40.

**Tuberculosis. Its Origin and Extinction.**—By W. PUKETT TURNER, M. D. The Macmillan Company, New York.

The author of this book states in his preface that the views expressed are so completely novel, so purely original and so utterly unorthodox, that they cannot fail to provoke hostile criticism. In this statement he certainly is correct. In the recapitulation, the statement that man never acquires tuberculosis by inhalation is certainly unorthodox. The influence of actinism upon animals in the prevention of tuberculosis is a point well taken. The following statement of the author is of unusual interest: "In Battersea, Eng., they have four plumbers and three carpenters as meat inspectors, and in Hackney, the duties have been

committed to two plumbers, one carpenter, one compositor, one bricklayer, one florist, one builder, one surveyor and one stone mason; in Portsmouth a solitary butcher has received as colleagues three school teachers, one medical dispenser, one carpenter and one train conductor."

**Lateral Curvature of the Spine and Round Shoulders.**—By ROBERT W. LOVETT, M. D. P. Blakiston's Son & Co., Philadelphia, 1907.

In this little volume of 185 pages, Lovett places before the profession all of the more modern ideas relating to the subject of scoliosis. The author's reputation as an orthopedic surgeon and original worker in this line is sufficient to denote the character of the volume. In the first and second chapters, he covers the anatomy and movements of the nondiseased spine. The remaining chapters deal with mechanism, description, symptoms, pathology, etiology, diagnosis, prognosis and treatment of scoliosis. Following these, a chapter is devoted to faulty attitude and round shoulders. His description of movements of the spine presents an immense amount of original work done by the author several years ago. The work is especially interesting to the orthopedic surgeon, and is highly commended to anyone interested in lateral curvature of the spine.

**Nephritis.**—By SEELYE W. LITTLE, M. D. Grafton Press, N. Y., 1907.

This brief, but very readable, volume on nephritis will be found quite interesting to the general practitioner, but of very little use to the student. The book should be read as a whole to grasp its value. The author's logic throughout is most creditable.

**Physicians' Manual of the Pharmacopeia and the National Formulary.**—An epitome of all the articles contained in the U. S. P. VIII and the National Formulary by C. S. N. HALLBERG, Ph. G., M. D., and J. H. SALISBURY, A. M., M. D., American Medical Association, 103 Dearborn Ave., Chicago, 1907. 12 mo., pp. 198.

This little book of less than 200 pages, clearly printed, conveniently arranged, and small enough to carry in the pocket if one chooses so to do, is commendable without reserve. It furnishes the physician with an accurate list of the preparations of the Pharmacopeia and the National Formulary, with their composition, strength, ordinary dosage and general uses. In addition, there is an index of therapeutic suggestions, which may be taken for what it is worth. The book would be improved by a section on incompatibilities and flavors, and perhaps here and there a suggestion as to the preferable method of administration of particular drugs. With this book in his possession, the physician need not resort to the prescription of nostrums in order to obtain conveniently available and eligible mixtures of standard drugs, while the model formulas given may offer valuable hints as to extemporaneous prescription.

**Hay Fever.**—By WILLIAM LLOYD, M. D., and HENRY J. GLAISHER, London, 1907.

An excellent description of hay fever is found in this volume of 90 pages. The review of opinions of exciting causes is well worthy of perusal. The treatment is thoroughly reviewed, and the illustrative cases in the last chapter are very instructive.

**The Ear and its Diseases.**—By SETH SCOTT BISHOP, B. S., M. D., LL.D. F. A. Davis Company, Philadelphia, 1907.

Owing to the abridgment of the ear division in his former work on Diseases of the Nose, Throat and Ear, this separate volume supplies that deficiency in a manner most complete. The author's treatment of the anatomy and physiology of the ear in so thorough and concise a manner, is a feature not found in other works of its size, and is strongly to be commended. Taking up the diseases under the unusual natural divisions of the external, middle and central ear, subdivisions are made following the natural anatomic relations, making the diseases of each complete in themselves, in point of pathology, etiology, symptomatology, diagnosis and treatment, without losing sight of the relation which any one part bears to the whole. The extension of ear diseases to the cranial cavity, a not infrequent complication, is well treated. The ill effects of constitutional diseases and drugs, and the general consideration of diseases of the ear, nose and throat in their relation to the ear, are two chapters specially to be commended to the general practitioner. The absolute freedom from "padding" is a notable feature from the beginning to the end of this work. Sufficiently concise for the student and general practitioner, who may desire definite information without extensive reading, it is nevertheless sufficiently complete in the handling of each subject to be a valuable addition to the reference library of any one engaged in special work.

**Practical Fever Nursing.**—By EDWARD C. REGISTER, M. D. W. B. Saunders Company, Philadelphia and London, 1907.

The necessity of competent and intelligent nurses in the treatment of fever cases has long since been considered a factor in their prognosis. The best nurses invariably are those who have a fair knowledge of the symptoms, pathology, dangers, prophylaxis and treatment of a given case. Register has very ably presented in this work, the material necessary for a thorough and competent fever nurse. The first 97 pages are devoted to general considerations and prevention of fevers, while the remaining 247 pages cover with sufficient detail the etiology, symptoms, diagnosis, prognosis and treatment of 21 fevers. The author's style is very lucid, the illustrations and plates fairly numerous and instructive, and the text clear. It is a volume not only attractive to the nurse but of value to the teacher as well.

**The Care of the Baby.**—A Manual for Mothers and Nurses containing Practical Directions for the Management of Infancy and Childhood in Health and in Disease.—By J. P. CROZER GRIFFITH, M.D. Fourth edition, thoroughly revised. W. B. Saunders Company, Philadelphia and London.

The fact that each of the three previous editions of this work has had to be reprinted several times to meet the demand is good evidence of its popularity and speaks well for the reception to be accorded this edition. The present work has been revised throughout and such changes have been made as were required by the recent advances in our knowledge in this subject. After a preliminary discussion of the normal baby and its care about one-third of the book is devoted to the various diseases of infancy and childhood. An appendix follows dealing especially with diet and miscellaneous remedies. A second appendix has been added which is intended more especially for the use of physicians and which discusses that most difficult problem of food mixtures which the author emphatically states should be left entirely in the hands of the physician. The discussions and directions are readily intelligible to the average mother and are of a most practical nature. The book though written primarily for mothers and nurses contains much that can be utilized by the student and physician and should be found on their book shelves.

**A Laboratory Manual of Physiological Chemistry.**—By ELBERT W. ROCKWOOD, M.D., Ph.D. Second edition, revised and enlarged. F. A. Davis Co., Philadelphia.

The value of physiologic or biologic chemistry in the study of vital processes and as a fundamental in a medical education has been recognized and accepted by teachers of the present day. Dr. Rockwood has prepared this book, with the aim of imparting accurate knowledge through the student's own observation.

The small stock of apparatus is readily obtainable. The arrangement of the subject-matter is excellent and the numbering of the experiments under each subject is ideal. As a manual of physiologic chemistry for medical students this book could scarcely be improved.

**Diet in Health and Disease.**—By JULIUS FRIEDENWALD, M.D., and JOHN RUHRAH, M.D. Second edition, thoroughly revised and enlarged. W. B. Saunders Company, Philadelphia and London.

In the second edition the authors have rewritten and enlarged the section upon salts, and discussed the work of Chittenden, and given a more extended account of Prochownik's diet for pregnancy complicated by contracted pelvis, and have added an account of the diet at water cures and of Klemperer's work on oxaluria. There is also a revised list of recipes and a new set of diet lists. This book is intended for the [general practitioner,

hospital interne, medical student, and for reference.

The first portion of the book discusses the physiology and chemistry of digestion, the classes of foods, beverages, and stimulants, various factors in their bearing on diet, infant feeding, diet for special conditions, and special methods of feeding. The second section gives the diet in disease, army and navy rations, dietaries in public institutions, recipes, the chemical composition of American food materials, rapid reference diet-lists, weights and measures, and a short list of books on food and diet. Under the subject of "Disease in which Diet is a Primary Factor," is a chapter on Obesity which is well written. All the various wellknown treatments for "oily dropsy" are given in detail. The diet in diabetes mellitus is worthy of careful reading. The style and printing of this book are attractive, and in no other book available can there be found so much condensed valuable information concerning food as is given in this volume.

**American Practice of Surgery.**—Edited by JOSEPH D. BRYANT, M.D., and ALBERT H. BUCK, M.D. Complete in eight volumes. Volumes I, II, III. William Wood & Company, New York, 1907.

This elaborate and extensive system of surgery, compiled by American and Canadian authors, is now in the hands of the publishers with three volumes before the profession. These volumes present many features creditable to the editors as well as to the contributors. The arrangement and method of presenting the subjects, the limitation of repetition, so common in works written by many authors, the excellent text, and the numerous, beautiful and instructive illustrations deserve most praiseworthy comment. The introduction is an edifying and well-written initiative to Volume I. The evolution of American surgery as here described is most interesting, and throughout this chapter are found plates of the more noted surgeons up to a later period with a brief biography of many. The achievements of individual men have not been magnified but stress has been laid upon special features, educational and experimental. Bacon reckons history as the chief component part of learning, and therefore we, as scientists, should not disregard the importance of surgical history.

Volume I is written by 15 reputable authorities and is divided into five parts. Part I covers Surgical Pathology, including inflammation, disturbances of nutrition, process of repair, tumors, theories of tumor formation, and parasitic relations of cancer. Part II deals with Complications and Sequels including infections in various surgical diseases and conditions and surgical shock. Part III is devoted to General Surgical Diagnosis with especial reference to general principles, body fluids and their diagnostic value, the epiphyses and their radiographic interpretation and technic of radiographic work and interpretation of radiographs. Part IV is confined to General Principles of Sur-

gical Treatment and various procedures, instruments, etc., that facilitate the application of these principles. Part V is limited to General Surgical Prognosis and index to Volume I. Special mention should be made of the excellent chapters on radiographic work which are not only abundantly illustrated but well written and very readable.

Volume II is written by 14 contributors and contains Parts VI to X inclusive. In Part VI special reference is given to the Diagnosis and Surgical Treatment of leprosy, plague, glanders, anthrax, actinomycosis, myeloma, rhinopharyngitis, mutilans and scurvy. Part VII is a general survey of Syphilis and Tuberculosis from a surgical standpoint. Part VIII is devoted to abscess, ulcer, gangrene, surgery of diseases of skin, surgical diseases and wounds of muscles, tendons, bursas, connective tissue, nerves, and lymph nodes and vessels. Part IX takes up burns and the effects of electric currents and lightning, and congelation or frost bite. Part X includes simple and infected wounds of soft parts by cutting or piercing instruments, gunshot wounds, and index to Volume II.

Volume III presents 11 contributors and contains Parts XI to XIII inclusive. Part XI or Chapter I of the third volume includes Poisoned Wounds, animal and insect. Part XII covers fractures, pseudoarthrosis, inflammatory infections, noninflammatory and syphilitic affections of bones, and tumors originating in bones. Part XIII includes chronic nontuberculous and non-traumatic inflammations of joints, tuberculous diseases of bones and joints, and wounds of joints and index to Volume III.

The completion of this system will bring before the profession a work so stupendous and thoroughly complete that without doubt it will rank second to none as a surgical treatise and reference edition.

**Surgery.**—Edited by W. W. KEEN, M.D., LL.D.  
Volume II. W. B. Saunders Company, Philadelphia and London, 1907.

The second volume of Keen's climacteric work is, as the first, a much desired and extremely practical addition to the reference library. It is thoroughly complete in the subjects included and is filled with the necessary detail so much looked for by the average surgeon. The contributors to this volume are all American teachers, men of international repute all of whom have added much to the literature of medical and surgical science. The surgery of bones, joints, muscles, tendons, nerves, skin and lymphatic system is considered in the minutest detail. The book throughout and especially the chapter on Orthopedic Surgery is well illustrated. Probably the most valuable chapters are those on the surgery of nerves and of the spine. The pages devoted to traumatic insanity and surgery among the insane are worthy of perusal and will be found intensely interesting. The reference literature found at the end of each chapter makes the work almost invaluable. This volume will appeal very strongly

to the orthopedic surgeon and will be found an excellent book for reference by the general physician.

**Human Anatomy.**—Edited by HENRY MORRIS, M. A., M. B., London, F. R. C. S., Eng., and J. PLAYFAIR McMURRICK, A. M., Ph. D. Fourth edition. In five parts. P. Blakiston's Son & Co., Philadelphia, 1907.

Much commendation is due the publishers of this standard work for presenting the same in five moderate sized volumes. The many advantages of the divided edition are perfectly clear, and will, we are sure, soon replace the cumbersome single volumes. The student will undoubtedly accord to this edition a most favorable reception. Most of the revision of this work has been performed by American anatomists, and this feature, no doubt, will aid in the increase of its popularity and use in the American school. The work is now before the profession in five neatly bound volumes. Volume I includes general morphogony, osteology, and syndesmology, containing over 300 pages. Volume II covers muscles, circulation and lymphatics in 330 pages. Volume III includes the nervous system and organs of special sense in 327 pages. Volume IV covers digestion, respiration, urinary, reproduction, ductless glands and skin in 182 pages. Volume V includes surgical and topographic anatomy in 140 pages. The text throughout is clear and well written. Many illustrations which appeared in previous editions have been omitted and a large number of new ones added. The mode of describing illustrations is most practicable. The Basle Anatomical Nomenclature (B. N. A.) which was adopted at the Anatomical Society meeting in Basle in 1895 with the purpose of systematizing and simplifying the nomenclature of anatomy which in the course of ages has become confused and divergent in different countries, is used throughout the work with the more familiar terms in parenthesis. This is the first anatomy in English to adopt this terminology and there is little doubt but that it will sooner or later be universally adopted. The writers are also to be lauded for their work in preparing the literature.

**Manual of Surgery.**—By FRANCIS T. STEWART, M. D. P. Blakiston's Son & Co., Philadelphia, 1907.

Within the covers of this manual of 735 pages will be found modern surgery in a condensed and terse form. It contains more detail than the compend and less than the large cumbersome surgical volumes. Superfluous words and questionable theories are not included, but the necessary facts are presented in a clear and well-written text. As the author prefaces, it was prepared for the undergraduate and busy practitioner, and he has accomplished this end most admirably. The volume is bound in limp leather and contains over 500 illustrations. The surgery of the genital reproductive organs of both male and female is given due space and is carefully considered.

## CORRESPONDENCE.

## THE SHIP SURGEON.

BY

A. L. BENEDICT, A. M., M. D.,  
of Buffalo, N. Y.

*To the Editor of American Medicine:*—Apropos of your editorial on the ship surgeon, allow me to make some comment, based on experience as substitute on two trips in different years. Possibly my experience was more fortunate than the average and beside, one does not at first discover the disagreeable factors in a position. My service was with the Holland-American Line, and on the smallest and oldest ship except one held in reserve for emigrant transportation. While the salary is, as you state, "fifty dollars a month, more or less," there is an additional payment based on the number of passengers, which more than doubles the income. There are also various perquisites of minor account amounting to about ten dollars a month. For three weeks out of every five, the surgeon has every luxury of board and personal attendance enjoyed by first cabin passengers—indeed, in many ways superior—and although he usually boards off the ship while it is in harbor, I believe that this is optional. Counting board at what it would cost the private practitioner to live, this amounts to about \$1,400 a year (ten trips annually) and with no professional expenses. For larger ships, the equivalent is \$2,000 or more.

Now, I quite agree with you that the surgeon should be allowed to make charges for services in a business-like way. At present, it is contrary to rules to make professional charges but custom is stronger than law. The ship's officers and crew and the steerage passengers should obviously receive free services. So, too, should any passenger in the event of an accident or other condition for which the company may reasonably be held responsible. Whether seasickness should be included in this category or not, is a moot question. Honorable passengers, rule or no rule, of course insist on paying the surgeon for services in connection with any sickness outside this category and the attempt to inforce the rule too strictly would ultimately lead to increased expense on the part of the company.

It is rather difficult to discuss the delicate question of "status" from a brief and explicitly temporary experience. Still, with all possible allowance for personal factors, and for the fact

that a martinet may make the necessary and proper discipline of a ship, or any other institution, a hardship to his colleagues, it seems to me that the general features of the medical service are very favorable. The surgeon's room must, as you state, be accessible from all divisions of passengers' and crew's quarters but the very fact that it must be convenient to the first cabin passengers, insures that it shall be well located, commodious, and comfortable.

On this ship, a special steward was assigned to the surgeon and purser, insuring prompt and abundant attendance. The work of the surgeon is not, except in an emergency, either hard or disagreeable. Not so hard, for instance, as the work of a busy general practitioner or specialist on land, but it must be remembered that the depressing effect of the sea air renders it impossible to exact of any officer or seaman quite the amount of work that would be expected on land. The surgeon on this line ranks with the first officer and the chief engineer and would take command of the ship in case of the disability of the captain and four navigating officers. In medical matters, the surgeon is practically supreme, in the same sense as the medical officer at a military post or in the navy. That is to say, while there may be a conflict of authority between the surgeon and another officer as regards excusing from duty a member of the crew, and while the captain's order is absolute with regard to any person on the ship, the responsibility of disregarding the surgeon's order is too great to warrant any infringement of his authority when properly exercised.

While personally preferring private practice, for several reasons, it seems to me that the "status" of the ship surgeon, at least for the line mentioned, is dignified, honorable, and pleasant. As one captain expressed it, "Doctor, I am first on the ship, you are second," and he might have added that there were only two others to share the second grade and that the difference in rank was recognized only as it must be in any military or naval establishment.

As to the question of the adequacy of pay, it should be remembered that, except for incidental expenses for an average of about one-fifth of the year, the surgeon can buy in Europe, at European prices, and that his current expenses are almost nothing, except for clothes. Whether we make comparison with the average practitioner of medicine, either in America or abroad or with other ships' officers the surgeon is well paid.

## MIND CURES AND INSANITY.

BY

A MARTIAN OBSERVER.

*To the Editor of American Medicine:*—It does not seem unreasonable to assume that systems of healing which depend entirely upon the control of the mind over the body, even to the complete negation of bodily disease, ought to find their entirely favorable and most unopposed field in combating mental troubles, especially those less demonstrably connected with known lesions of the cerebral neurons and their blood supply; that here, they should exhibit the most convincing proofs of their efficacy.

The true field of the rational therapeutics, at present so publicly recognized and zealously exploited, admittedly lies among the functional disorders which, wherever they may be located in the consciousness of the patient, have their real seat in the warped and disordered mind. Acting on this basis, the prudent though enthusiastic healer seeks a diagnosis before he is too confident of a cure. Ignorance permits oversights, and oversights may lead not merely to failure but to disaster. On the other hand since enthusiasm may thrive better when not responsible for the prognosis, it is often well that the therapist should not have been too carefully instructed. He should not have, even in his lower consciousness, those doubts which may lurk in the mind of the acutest diagnostician.

The harm done by the prevalence of the various forms of "mental healing" has been directly, by standing in the way of efficient treatment, and indirectly, by hindering in the community the progress of correct and reasonable views on the subject of disease. That comfort has been given to many by promoting a more cheerful and trusting frame of mind, even if delusive, among those who cannot take good advice and cultivate philosophic sentiments without a liberal admixture of humbug or on some basis of unintelligible doctrine, is undoubtedly true; and we may even go further and admit that real cures of unreal diseases have been accomplished in this way. We might indeed strike a balance in favor of a popular cult if only we could omit one item. We might offset intellectual enfeeblement by a gain in courage and patience. We might check off the shortening of life from the neglect of operable cancer cases against the happiness given the inoperable ones by hope based upon ignorant assurances.

Although "religious insanities" are recognized among the older authors as special forms to be included in the larger groups of "melancholia" and "mania" yet to "religion" as a real cause is rightfully assigned comparatively little weight, the percentages varying, partly, it must be presumed according to individual experience, but probably quite as much according to the definition of "religion" adopted by the author from the numerous ones offered by divines and historians.

At present I presume the prevailing view to be that, although intense excitement of any kind and of course among persons whose thoughts have been previously directed toward religious subjects, such as "revivals," may be the exciting cause of some neuroses, these are usually of a somewhat temporary character more akin to hysteria than to true insanity; but that religion as taught in most churches in its less emotional forms has no importance as a real cause of chronic alienation.

When insanity has arisen in a person of previously sound and healthy religious feeling, even when the content of delusions has been of a religious form, it has usually been looked upon as either a mere coincidence, with the religion determining only the superficial manifestations, or at the most a case in which faith has not been strong enough to combat the workings of disease.

It is not unfair to extend this view to the various cults and systems which define the relations of the mind or soul not only to a higher power and an unknown world but to the body and its diseases, these definitions being more or less vague and unintelligible theories or a new interpretation of the gospel.

But a number of occurrences, partly under my own observation and partly from other sources, have led me to question the correctness of this view and to inquire whether the teachings of some such random and fanciful psychologies have not had a direct effect in the actual causation of some cases.

A young man came under my care immediately from an insane hospital (his second period of confinement) where he had been violent. He was the son of a "Christian scientist" and had become engaged, probably partly on account of their common interest, to another votary of Christian science, both of them having been "readers." During his stay in the hospital he had endeavored to alleviate the sufferings of his fellows by reading to them from the Bible of the sect. His friends, however, had judiciously, but, as it seems to

me, not with devout consistency, taken away from him the books of this class.

Such a case, of course, probably one of ordinary "dementia præcox," proves little except the failure of Christian science as a prophylactic, and apparently also a lack of the firmness of faith usually observed among its votaries.

The immediate predecessor of this young man was a middle-aged woman of refinement and intelligence, married but childless, for years a prominent and devoted adherent of Christian science. She came accompanied by a professional nurse who made a specialty of Christian science. The patient had become firmly possessed by the delusion that she had been made, at the hands of another woman who had hypnotized her into a complete spiritual wreck, a being of utter nothingness, beyond hope of redemption, although she saw herself doomed to a long life of continued misery and utter despair. She never for a moment admitted that she was better or that there was the slightest possibility of her ever being better. Arguments to show the inconsistency of such an attitude with a doctrine of cheer, the control of the mind over the body and the non-existence of disease, seemed to anger her and she would reply only, "Oh, you don't understand! You can't understand!"

The woman who was supposed to have accomplished this malignant work was the brief acquaintance of a summer vacation, not known before or seen since. She was thought to be especially congenial and there was absolutely no reason for hostile feeling upon either side.

This patient remained in a condition of as profound depression and acute mental suffering as I have ever seen, walking the floor in agony for hours and denouncing the woman who had wrought her woe. She was not, however, in that condition of utter indifference to her bodily surroundings sometimes seen. This state persisted, with apparently unimpaired intellectual clearness, unchanged until her death by suicide evidently carefully planned.

Not long after the time at which this case was under observation there was reported in the daily papers the suicide of a lady prominent in "Christian science," the sister of a man still better known in the same cult—or business.

Soon after was the report of the suicide of a "rich mind reader and mental healer" who had so impressed her doctrines upon her followers that they would not believe her dead, although she had left directions for her crema-

tion. Later, was to be found in the daily papers the account of a business man, age 36, unable to cure himself of nervousness and melancholia by means of Christian science, committing suicide by a deliberate and carefully planned method.

The case of a man who leaped from a fourth story window to the sidewalk with an "Eddy book" in his hand, expecting to be borne up by miraculous powers as a testimony to the truth of the doctrines, would probably be objected to as not belonging to the same category.

Now comes the publication in the daily press of the belief held by enthusiastic scientists—for instance the very intelligent fiancée of the patient first described—that a "dire influence can be brought to bear by any evil mind upon a person selected for injury" and that even the venerable foundress herself suffers from what her "next friends" call a "delusion" but which her religious adherents consider a well-founded belief, "a horror of malignant animal magnetism."

Are the financial beneficiaries protected against such weaknesses by the soothing influence of sound business sense? Not by consolatory doctrine but by the very tangible results of its propagation?

If any fortress is as strong as its weakest part what can be the strength of that which builds into its very citadel material for its inevitable destruction? E.

**The Physician's Duty.**—Professor Donald Ross relates in *Nature* how, as officer of the Indian Medical Service, he once asked his chief if he would like him to investigate fevers during his abundant leisure, and the answer given was that his duty was not to investigate but to cure! According to Professor Ross there are hundreds of able men with abundant leisure, among the Army Medical Staff, who, with a little encouragement from the authorities, might by this time have succeeded in discovering means of preventing scourges like plague and malaria.

**To Avoid Unnecessary Noise.**—The citizens of Washington, Pa., are making a crusade against locomotive whistles, especially those that murder sleep at night. They have impressed the Burgess and Council with the enormity of the offense and the borough authorities are consulting attorneys to see if there is any law that can be invoked to abate the whistle nuisance.

## ORIGINAL ARTICLES.

THE EFFECT OF SOME DISEASES OF CHILDHOOD UPON MENTAL DEVELOPMENT.<sup>1</sup>

BY

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On examining the brain of a baby one does not wonder why it is unable to walk, or why, even after the muscles have gained sufficient strength to perform their functions, the gait is unsteady and the movements of the hands and arms more or less ataxic. For the cerebellum, which presides over coordinate movements, will be found to be much less developed than the cerebrum. As the brain grows, and one mental faculty after the other becomes manifest, it is interesting to note that there is a certain order or method in their appearance. In the gradual evolution of the race the simplest mental faculties appeared first, then, as ages rolled by, the more and more complex ones, till the race was finally distinguished from the lower animals by a sharp line of demarkation.

If one follows the gradual opening up of the intellectual faculties of a child, it will be found that the different phases of his mental nature make their first appearance, or reach their full development in the same order in which their original advent was made in the history of the race. In fact, the intellectual evolution of the race is reproduced on a small scale in the growth of the child's mind, beginning with the first evidences of consciousness and ending with the full development of the mature mind of the adult—a result seldom reached before the age of 35.

From the foregoing it will be seen that the mind of the normal child should develop along the lines of regularly established rules, and that any marked deviation therefrom is an indication of the presence of some unusual influences. While heredity exerts a much more powerful influence on the body of the offspring than upon the mind, yet that the

child inherits at least a portion of its mental strength and characteristics is generally admitted. Galton concludes, referring to the general question of heredity, both mental and physical, that the child inherits a fourth from each parent, and a sixteenth from each grandparent. Weismann advances the theory that only the inherent powers of ancestors can be transmitted to the offspring, and that acquired characteristics which are the result of education and training cannot be inherited. Other authorities, however, notably Darwin, Locke, and Lamarck, are opposed to such a view, and most evidence seems to be in their favor. If Weismann's views were correct it would be difficult to account for the intellectual advancement of the race, as each child would have to begin at the beginning, receiving no heritage from his parents' years of mental training. That the mental powers of the parents are really transmitted, more or less diminished in force or modified by conflicting heritage or subsequent environment, has been abundantly proved. From this general direction given to the mental growth of the child, however, there is a constant tendency to diverge, always in the direction of the general average of the race, or of that portion of it which forms part of the child's environment.

But the child seems to be able to advance only a certain distance outside the mental sphere of its ancestors, and there further progress stops suddenly. An illustration of this is plainly seen when a child from one of the less favored races is brought into the civilization of the more gifted. Even when placed in the best colleges, to be educated by the side of their more fortunate brothers or sisters, they do not develop minds of quite the same depth or broadness of character. For a while, such children often show a remarkable aptness for learning, even outstripping their more favored rivals. But there comes a time when their mental development seems to have reached its limit, beyond which it is impossible for them to advance. It is as though the seed were sown upon shallow ground, springing readily into rapid growth, but soon reaching its maxi-

<sup>1</sup>Read before the Montgomery County, Ohio, Medical Society, March 1, 1907.

mentum of development because of lack of power behind it.

That a good deal of the credit for the character of the child's mind depends upon the environment in which his youth is passed, also admits of abundant proof. Even the character of the country and the nature of the landscape by which he is surrounded during his early years have their effect. Thus the man whose childhood was spent where he could look daily across the broad expanse of the ocean, and watch ships going and coming, is seized with an irresistible desire to roam and travel. While those who are raised in the mountains, breathe in with the clear air a spirit of freedom and love of individual liberty which stamps itself indelibly upon their characters.

A close study of the nutrition of the fetus while in utero would be a valuable aid in solving many of the problems connected with the study of the child's mind. For we cannot afford to ignore the fact that all mentality has a physical basis, and that without a healthy, well-nourished brain there cannot be a clear and symmetrically developed mind. A study of the causes which are supposed to produce imbecility and feeble-mindedness only tends to emphasize the importance of nutrition, both prenatal and postnatal. While the ancestors may not have shown examples of either insanity or idiocy (although these are common) there will frequently, one might say usually, be found other defects. Both syphilis and tuberculosis in the parents stand near the top of the list among the causes of mental defectiveness, with intemperance following closely. Many other diseases, especially of the nervous system, when found in parents, are predisposing factors in the causation of mental enfeeblement, notably epilepsy, hysteria and neurasthenia, chronic neuralgia, and organic diseases of the brain. Bad health of one or both parents, senility or unhygienic surroundings are causes not to be ignored.

These are all hereditary causes. And yet in most instances it is not the disease itself which is transmitted. The cells of the brain can no more act with full and normal power

unless fully nourished than can the muscles. Hence, it would seem that the underlying condition is one of poor nourishment, resulting in weakness and instability of the brain cells. Thus an idiot or an imbecile, born of either syphilitic or tuberculous parentage, need not necessarily be either syphilitic or tuberculous, nor the defective child of the drunkard have transmitted to him the alcoholic poison. And the offspring of old age, although mentally weak, may not inherit any disease at all.

But running through all the conditions which, when present in the parents, are liable to be followed by idiocy, imbecility or mental weakness in the children will be found one common and important condition, viz., a general lowering of vitality, an interference with the processes of metabolism, resulting in a poorly nourished body which bequeaths to the offspring not only flabby muscles and weak hearts, but unstable, weak brain cells, and as a result more or less defective minds. Thus it may be conceded that the complex question of heredity has, as its basis, the problem of nutrition. That brain which is best nourished will generally be linked with the brightest mind, and those diseases which, in the parents, are most likely to be followed by mental deficiency in the children, are chiefly those which affect the nourishment of the nervous system.

We have seen that during the earlier years of childhood the mind develops along certain well-determined lines, its growth being characterized by a steady and gradual increase of power and scope, rather than by any sudden strides or revolutionary changes. There is but one period in the life of an individual when such a decided change in personality is physiologic, viz., the period of puberty and adolescence. At this time a new character is developed, a new personality becomes manifest, and the mind gradually changes from that of the child to that of the adult. This mental change is not accomplished suddenly, and not always without the occurrence of nervous and mental troubles of a more or

less serious nature. For the complete mental change which takes place during adolescence extends over several years, and is often accompanied by mental anomalies and traits of character not only interesting as a study of the personality of the individual, but sometimes of very serious import.

The average age of puberty in the male is 14.3 years; while in girls it is somewhat earlier. Mathews Duncan considers that the pubescent period in girls is completed at about the age of 25, while Clouston accepts this limit as applying to both sexes. A close observation of the mind of a child will show a gradual change in character for a certain period before the actual advent of puberty, especially in girls, in whom the pubescent period may begin as long as one or even two years prior to the first menstruation. During this time a new character is developed, and the individual, from a mental standpoint, assumes gradually the characteristics of the young man or woman. It is the period of the growth of the sexual character, and carries with it all the instability and change of mood naturally to be expected at a time in life dominated to a large extent by the influences exerted upon both mind and body by the rapid development of the erotic side of the disposition. Coherent thought and steady mental work are more difficult than before, the mind having a tendency to wander from one subject to another, or alternating between ambitions and ideas of future greatness, and periods of melancholy and feelings of despondency. This condition of the mind is accompanied frequently by talkativeness, a tendency to exaggerate the natural effects of the emotions, an extravagance of thought and expression, together with a certain boldness of deportment and a disposition to attract attention—or its reverse, a habit of modesty and a desire to avoid observation.

During this entire period great care is needed in the mental training of the child, as any injudicious crowding in schoolwork or undue excitement in social life is sure to leave its results upon the mind or nervous system. While this is true in regard to both sexes, it applies

more forcibly to girls than it does to boys. "Multitudes of our young girls," says Weir Mitchell, "are merely pretty to look at, or not that. Their destiny is the shawl and sofa, neuralgia, weak backs and varied forms of hysteria—that domestic demon which has produced untold discomfort in many a household, and I am almost ready to say, as much unhappiness as the husband's dram."

It is at this period of a girl's life that she is too often crowded in her schoolwork, or allowed to enter too early upon a social career. If, in addition to her regular schoolwork, be added several hours a day in music, the danger is greatly increased. The exciting influence of music and the mental strain of hours of monotonous practice upon the piano, do not receive the attention of either parents or physicians which their importance deserves. We have here one of the most powerful excitants known, and while the pleasure and refined influences emanating from it need not often be entirely forbidden, yet it should be borne in mind that lack of judicious control over its influences on girls of this age often results in subjecting them to a mental strain which they can assume during puberty and adolescence only at their peril.

While most of the symptoms of puberty are perfectly normal, yet this period exerts an undeniable influence on the mental life of the individual, often giving to symptoms an importance and qualities which they do not possess at other times. And physical disturbances which make their first appearance in a comparatively unimportant form during adolescence may really be precursors of more serious mental or nervous disturbances later in life. The similarity between the normal mental phenomena of puberty and hysteria are easily recognized, and the relation between the two conditions is very close, hysteria being a common complication of adolescence.

While the foregoing conditions are more marked in adolescent girls, they are by no means necessarily absent in boys of the same age, although modified by the difference in sex, mode of life and environment. Growing

boys live more of an out-of-door life, and are less inclined to overwork in school than girls and less likely to be injured by social claims, and so pass through this critical period with less mental strain.

A common physical condition during adolescence is anemia, especially in girls, and when it is combined with nervous disturbances it causes a long and protracted period of ill-health, which, like chorea occurring during puberty, may be characterized mentally by dulness, lack of pleasure in mental work, inability to exert the mind continuously, mental irritability and depression of spirits. Such children are often corrected for acts for which they should not be blamed, the fault lying in lack of self-control. They worry over trifles, are easily irritated and although normally good-tempered, they may become quarrelsome. The choreic cases especially may act at times in a semi-idiotic manner, laughing and crying by turns, and more easily than normally. The mental excitement may interfere with sleep, and in rarer cases may even end in mania and acute delirium.

While it is not the object of this paper to treat of insanity, the importance of this period of life in connection with the development of the more serious mental diseases compels a brief mention. Insanity occurring before puberty is rare, although numerous cases of genuine insanity in comparatively young children have been reported. But during puberty the advent of insanity is by no means uncommon, especially when there is a neurotic heredity. Cases of insanity occurring at this time are characterized by either a tendency to speedy recovery, or else they pass quickly into a condition of dementia or weakmindedness, which is very apt to be permanent.

Impulsive insanity or imperative concepts, in which fixed ideas recur with a predominating force beyond the control of the victim, often appear first during puberty. This may consist merely of the frequent and involuntary recurrence of some particular line of thought or mental conception, like the ever-recurring

strains of a popular air, which rings through the imagination, or the vivid reproduction of some event, pleasant or the reverse, which the subject is unable to eliminate from his mind, and which serves to interrupt the train of normal thought. These imperative conceptions may be so slight as not to constitute real insanity, but may be merely episodal symptoms of nervous disease or the exaggerated normal condition of adolescence. In the graver forms such imperative conceptions form part of the symptoms of the real insanities, especially melancholia and manic-depressive insanities. Under this head belong the so-called monomanias, such as suicidal and homicidal manias, dipsomania, pyromania, kleptomania, erotomania, and the sexual pervers. While these are not separate forms of insanity, but merely form part of a clinical picture of some mental disease, usually of the manic-depressive type, the appearance of any form of imperative conception or "obsession" during puberty is of very grave import.

Moral perversions are very common to the period of puberty, especially if there be strong inheritance of insanity; lying, thieving, lust, cruelty, and destructiveness being not uncommon. On the other hand, the impressionable character of the mind during adolescence is illustrated by the frequency with which the religious nature is awakened at this period. Beavan Lewis calls attention to the frequency with which religious exaltation occurs at puberty, and religious depression at the climacteric—the two extremes of religious experience corresponding naturally with the general mental tendency of the two epochs of life.

The sick child often shows the first symptoms of its illness in some mental change. Thus, unusual irritability of temper is often the first sign of an approaching headache. The same may be found in gouty children, and a fretful disposition and irritable temper may be not only the first, but often the only subjective symptoms of organic heart disease. This change in disposition and temper is often of considerable diagnostic value, espec-

ially when associated with other symptoms. Thus, it often ushers in attacks of cholera infantum and the acute exanthems, and in very young children, when accompanied by headache, nausea, or vomiting, slight and irregular rises of temperature, and constipation, very grave suspicions of approaching meningeal trouble should be feared, especially hydrocephalus.

Of the serious diseases which belong especially to the domain of childhood, coma is found most frequently in hydrocephalus, epidemic cerebrospinal meningitis, cholera infantum, infantile paralysis and following infantile convulsions.

The subsequent effects of the diseases of childhood upon the mental development are various. With the milder and more acute diseases even when the delirium has been considerable, no mental impairment is left behind. In hydrocephalus the prognosis is always bad, as cases of return to full mental power are rare. That such may happen, however, is illustrated by the famous case of Bright, of a patient who had lived to the age of 29 with almost normal mental powers, although his head was translucent when the sun was shining [behind him. In congenital hydrocephalus the child may be bright enough at first, but later imperfect nutrition and idiocy are almost sure to follow. In the acquired cases the mental symptoms differ considerably. In the milder types there may be simply defective intellectual development, as though the growth of the mind had stopped at the time of the illness. The child in this condition may live for years, although there is mental dulness, inability to fix the attention or to learn readily, with impairment of memory and sometimes defects of speech. If they play at all it is in a silly, half-idiotic manner, and they are careless and dirty in their habits. In the severer cases we may expect complete idiocy or imbecility. The intellectual development following the spinal form of infantile paralysis (acute poliomyelitis) is likely to be unaffected. In the cerebral varieties (infantile cerebral palsies,

infantile hemiplegia, etc.), the prognosis regarding the mind of the child is not so good, although in many cases the mind remains uninjured, and subsequent mental development is tolerably normal. The degree to which the mind is affected is directly proportional to the extent of the lesion; and in cases of diplegia and paraplegia, idiocy and imbecility usually follow, while after infantile hemiplegia we are more apt to find simple mental enfeeblement, the mind being more or less affected in nearly one-half of all cases. When hemiplegia has existed from birth, either idiocy or imbecility are very likely to ensue, the imbecility showing a decided tendency to increase as the child grows older, often with the advent of epilepsy.

Lithemic children are precocious, nervous, and irritable, but under proper care are capable of the highest intellectual development in after life. Cerebrospinal meningitis often passes off without leaving any mental impairment. But in a certain proportion of cases, in addition to physical defects, there will be found aphasia, attacks of sudden loss of consciousness, and intellectual weakness. Attacks of loss of consciousness, with more or less severe headaches, following meningitis, are pathognomonic of beginning hydrocephalus. In many cases of mental impairment following epidemic cerebrospinal meningitis, there is after some time gradual improvement, which may result in the complete restoration of the normal mind. In others, however, the condition is permanent.

The physical element in chorea is often overlooked, and it is well to warn the parents that a change in the child's disposition and mental powers is an important part of the disease. In the milder cases the mental changes are slight in degree and often precede the motor disturbances. A general change in the disposition is first noticed, and may often be detected a week or so before the involuntary movements begin. Often there are emotional symptoms, the child laughing and crying too easily, and disturbed sleep and night terrors. There may be general intellectual

weakening with loss of memory and of interest in his play or schoolwork. This may be accompanied by inability to exert the mind continuously along the line of any special work, and he is irritable and quarrelsome, often being considered unruly when the real trouble is loss of self-control. In older children and in the severer cases there may even be hallucinations, or actual mania or active delirium. All the above symptoms may be found in the premonitory stage, before the advent of the choreic movements. As the disease progresses the same mental condition found in the prechoreic stage may be expected to continue, and will frequently be aggravated.

Convulsive tic, which is often mistaken for chorea, is really a psychosis closely allied to hysteria, and often presents some of the features of monomania. This condition should be distinguished from true chorea, although similar involuntary movements are present in both diseases. The prognosis is bad in convulsive tic, but in the true chorea of childhood (chorea minor, acute chorea or Sydenham's chorea) the condition usually passes off in a few months and the normal powers are fully regained. In rare instances, however, the mental impairment has progressed to complete and permanent dementia. In severe cases hallucinations of sight and hearing are tolerably common.

The most serious mental manifestation is an excitable, maniacal delirium, known as *Chorea Insaniens*. Although the motor symptoms in these cases are usually well marked, instances have occurred in which they were entirely overlooked and the patient sent to an asylum as insane. After recovery from the motor symptoms of chorea some intellectual enfeeblement often persists for a while, but finally disappears. Permanent injury to the mind is rare, even in the severer cases.

Diseased conditions in the respiratory apparatus are very prone to interfere with the mental development of the child. This applies with especial force to diseases of the nose and nasopharynx, including acute or chronic nasal diseases, adenoids and diseased tonsils. Au-

thorities do not agree on the proposition that impairment of intellect is one of the symptoms of enlarged tonsils and adenoids. But whether the result is directly traceable to the presence of these growths, or only indirectly by interference with the general health or by impaired hearing, instances in which children formerly dull and behind in their schoolwork have shown decided mental improvement after the removal of these glands, are not lacking. A slight degree of auto-intoxication characterized by mental dulness, in both children and adults, due to the resorbing power of the nasal mucous membrane in catarrh and fetid conditions of the nasal passages and accessory sinuses, must be recognized. In a recent investigation concerning enlarged tonsils, a significant fact was found in the discovery that of the children who progressed slowly in their school, enlarged tonsils were found in three-fourths of the cases. A transient delirium has been noticed as following nasal operations, and an impairment of memory is quite commonly noted in connection with chronic lesions of the nose and sinuses.

The aphorism of Locke, that nothing can enter the mind except through the senses, is accepted by every one, and is proved by the results of many of the defects of childhood. A child with defective hearing or sight obtains only a restricted idea of the world which cannot help influencing his mental development. This condition is often present to a slight extent for some time before it is recognized, and the child is backward in school and thought to be dull, when his only fault is a slight deafness. A deaf child always impresses one at first as inattentive and stupid, and because of the harshness and ridicule to which he is subjected as a result of this unjust judgment, he becomes sensitive, and finally loses interest in his play and work. Damage is often done to the child's character before his real condition is recognized, as both teachers and parents form the habit of treating him as stupid, when he is really in need of the aurist. His mind does not develop as it should, and the effect is unfortu-

nate in many ways. When improvement in the hearing cannot be brought about, much can be done for such children by special teachers trained for the work among these unfortunate defectives.

The mental condition which results from eyestrain is in many particulars similar to that produced by partial deafness. In fact, mental derangements, especially in children, are seldom the result of central lesions, but are usually mental reflexes from peripheral irritation. So, as in ear lesions, the child with defective vision acquires an irritable, morose disposition, with a tendency to shrink from the games of his playmates, in which, indeed, he is often unable to hold his own. Poor spellers are often found to have defective vision, so that the image of the properly spelled word, in the correct sequence of its component parts is never clearly defined upon the retina. Children with myopia often make mistakes in copying their work, and the stimulus which normal children receive from subtle changes in the expression of the teacher's face is missed, thus depriving them of a valuable portion of the effects of the teacher's personality. Eyestrain is sometimes the cause of many reflex neuroses in children, such as chorea, night terrors, and an irritable disposition.

Another frequent cause of irritable disposition and mental dulness is found in bad teeth. A child who suffers from toothache loses sleep and undergoes a nervous strain which makes it impossible to do good work. In addition, stomach troubles and malnutrition are added to the unfavorable condition already present, and the mind necessarily suffers. Records made in large schools show that pupils with bad teeth are uniformly backward.

**Caring for Opium Victims.**—Dr. M. J. McKinnon, county physician at York, Pa., declares that a large appropriation for drugs will be required next year. He says this expense is caused by the county caring for about 12 persons who are addicted to using opium. He further asserts that such persons must have regular allowances of the drug in some form or other, else they will become violently delirious or insane.

## GASTRIC ULCER COMPLICATED WITH THE SYMPTOMS OF CHOLELITHIASIS.

BY

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In the past few years a number of papers have appeared in medical literature, devoted to a consideration of the significance of pain and other symptoms in the epigastric region. Much of the discussion has naturally centered about the symptoms occasioned by gastric ulcer and by cholelithiasis. The clean-cut and concise differentiations between these conditions have been so emphasized that it would seem a comparatively easy matter to differentiate in any given case. To show that it is not always easy, and that in some cases it is practically impossible to arrive at a definite diagnosis, is the object of this paper. I shall attempt this by considering the anatomic relations of the two organs concerned and by referring to cases which have come under my observation.

The gallbladder, when normal, lies at the angle between the ninth cartilage and the outer border of the right rectus muscle. From this point the cystic duct describes a curve upward and to the left, joining the hepatic duct to form the common duct at a point behind the first portion of the duodenum, which lies in the right half of the epigastric region, back of the eighth costal cartilage. From this point the common duct completes the curve downward and to the left, approaching the pylorus and ending in the second portion of the duodenum which lies midway between the median line of the body and the vertical line which separates the right hypochondriac from the epigastric region. The pylorus lies an inch or more to the right of the median line and on a level with the eighth costal cartilage. When the stomach is empty the pylorus lies in the median line. When distended it may reach two or even three inches to the right of the median line. (Eisendrath.)

It is thus seen how intimate are the topo-

graphic relations of the gallbladder and ducts, on the one hand, and the pylorus and duodenum on the other; it is also apparent that the relations may change and become quite confusing after the ingestion of food, or after the occurrence of any pathology of these organs with its possible complications.

The symptoms of an uncomplicated gastric ulcer are very definite. There is pain in the epigastric region, varying from a feeling of rawness to a sharp penetrating pain. It comes soon after eating or at least within an hour or two after. It is definite in its position, marked by a point of tenderness, and may be referred to the left side of the lower dorsal vertebrae, where there may also be a point of tenderness. There is vomiting soon after eating. The vomitus is sour and may contain blood. A gastric analysis will show a hyperacidity. There is decided pallor.

Gastric ulcer may occur with only one or without any of the foregoing symptoms. It may be recovered from, without the knowledge of either the patient or the physician.

The symptoms of uncomplicated cholelithiasis are equally definite. They arise only when the stone begins to move or produce an inflammation and ulceration. In many cases the symptoms may be entirely absent. Kehr says that only about 5 percent of people with gallstone are troubled with their presence. (Mayo Robson.) The presence of gallstones which are quiet, may be known only by a heaviness in the right hypochondriac region, or a dull pain in the right epigastric region, radiating anywhere, but most often to the right scapula. When the pain or colic comes on it is boring, stabbing, or tearing, and begins in the right hypochondriac region. It rarely bears any relation to meals, but usually begins late in the afternoon or in the early morning. There is vomiting of hyperacid contents. My observation with reference to gastric hyperacidity in biliary retention as well as in most cases of cholelithiasis are in accord with Dr. Friedenwald's, of Baltimore. There may be a feeling of chilliness and fever. In about 25 percent of cases, icterus will gradually come on.

The urine is bile-stained and the feces have an abnormal color. While the attacks are said to occur independently of the character of food and time of taking it, it is well known that strong peristaltic action of the musculature of the bile passages is often caused by active peristaltic action of the duodenum communicated to the bileducts.

These, in brief, are the symptoms of gastric ulcer and cholelithiasis.

When gastric ulcer occurs with these classic symptoms, the diagnosis is easily made, but unfortunately some, and at times practically all, of the symptoms of cholelithiasis easily lend themselves to the gastric ulcer group of symptoms, and a confusion arises which is difficult to harmonize with any preconceived pathologic condition. This is specially true in complicated cases of chronic gastric ulcer, and unfortunately gastric ulcer is often met or recognized only after complications have arisen. The most pronounced complications aside from perforation are peritonitis, circumscribed or general, adhesions, abscesses, and stenosis. It is readily seen that the occurrence of any of these complications may make a diagnosis between gastric ulcer and other conditions in the abdomen, such as cholelithiasis, pancreatitis, appendicitis and displaced kidney, practically impossible.

I recall a case seen in consultation which had been diagnosed appendicitis, because there was pain, tenderness, and tumefaction at McBurney's point. But after defining the exact position of the stomach, it was found the lower border came down into the hypogastric region and the thickened pylorus occupied the position of the appendix. It was also learned that there had been attacks which simulated gastric ulcer, and the symptoms of gastric retention existed. The subsequent history showed that appendicitis had been mistaken for chronic recurring gastric ulcer.

To illustrate further, I wish to direct attention to a few cases of gastric ulcer complicated with the symptoms of cholelithiasis in which the diagnosis was made or confirmed in the course of surgical operation.

**CASE I.**—Diagnosis at one time, gallstone; at another time, gastric ulcer. Exploratory operation. Band of adhesion which constricted both common duct and duodenum was severed. Relief for 16 months. Occurrence of gastric hemorrhage. Gastrojejunostomy. Recovery.

Mrs. D., aged 37, consulted me first, November 13, 1904. Eighteen months ago she had an unusually severe attack of indigestion with headache and vomiting. Since then she has had recurring attacks, similar in nature but accompanied with intense pain in the epigastric region. During the intervals there was more or less tenderness over this region. Fourteen years ago she gave birth to an only child and during her convalescence she had an attack which was diagnosed gallstone. She was jaundiced, but has not been jaundiced since. In my physical examination, I noted that the patient was emaciated, the stomach was dilated to the umbilicus, there was tenderness over the pyloric region and the right kidney was freely movable. The gastric contents showed free hydrochloric acid, 28; combined hydrochloric acid, 22; total acid, 82. I made a tentative diagnosis of chronic gastric ulcer, with possibly a perigastritis.

The treatment established afforded considerable relief for about seven months. During this time I occasionally felt a mass in the pyloric region, which I at one time diagnosed as an indurated pylorus, and later as a distended gallbladder. Suddenly, at the end of the seven months, she had a severe attack of pain in the epigastrium and became intensely jaundiced. I then diagnosed gallstone, and on July 24, 1905, the abdomen was opened by Dr. R. W. Stewart. To our surprise we found neither gallstone nor a sufficiently definite scar to warrant the diagnosis of chronic gastric ulcer, but a band of peritoneal adhesions which extended from the under surface of the left lobe of the liver to the hilum of the right kidney, which was prolapsed. We could demonstrate that tension of this band could make pressure upon the common duct, the cystic duct and the duodenum. This fold was severed and the abdomen closed. The patient was relieved of her attacks and remained well for 18 months. At the end of this time, symptoms again arose which made it appear probable that there was a gastric ulcer. Food was withheld from the mouth and rectal feeding instituted. The pain in the stomach was severe. Orthoform did not relieve it. Nausea was pronounced and in the course of treatment profuse hemor-

rhage from the stomach occurred which could not be controlled. Operation was indicated to control the hemorrhage. On November 18, 1906, Dr. Stewart again opened the abdomen and a large gastric ulcer was found near the pylorus, on the lesser curvature. No scars of other ulcers were found. Posterior gastrojejunostomy was done and was followed by immediate subsidence of all the symptoms. Until now, the patient has remained well with the exception of one or two occasions when slight symptoms of ineffectual drainage of the stomach occurred. There can be scarcely any doubt now that the adhesions found at the first operation were caused by previous ulceration of the stomach.

**CASE II.**—Diagnosis, chronic gastric ulcer with partial stenosis. Operation. Fundus of gallbladder adherent to stomach about one inch from pylorus, forming the base of an ulcer which had evidently perforated; transverse colon drawn up to the same area by adhesions. Gallbladder removed, stomach sutured. Gastroenterostomy. Recovery.

Mr. F. C. H., aged 45, referred to me by Dr. James K. Everhart, of Pittsburg, April 29, 1905, gave a rather indefinite history of retention of food in the stomach, beginning 18 months previously. The lower border of the stomach was one inch below the umbilicus. The symptoms of gastric ulcer were indefinite. Upon consulting with the surgeon, Dr. E. S. Montgomery, our attention was called to the symptoms and signs of gallbladder trouble. The patient was in the Passavant Hospital for some time under observation of Drs. Everhart, Montgomery, and myself. Retention of food and insufficient drainage of the stomach were the chief symptoms, and fullness and tenderness over the gallbladder area, with rigidity of right rectus muscle, the chief signs. Gastric analysis did not aid in clearing the diagnosis. With the idea that there might be an old cholecystitis with adhesions interfering with the pylorus, it was decided to operate, which was done August 1, 1905, by Dr. Montgomery. We found a great mass of adhesions involving the pylorus and the gallbladder. The latter was firmly adherent to the lower curvature of the stomach, and upon being separated, it was found that it had plugged the opening of a perforating ulcer, and was itself nearly perforated at the point which formed the base of the ulcer. The gallbladder was removed, the perforated ulcer closed and a gastroenterostomy done. The patient made an uneventful recovery.

This patient returned later to his home in Sweden when it was thought safe to travel, and there had an acute attack which was described by his Swedish surgeon as resulting from the vicious circle of bile. An enteroenterostomy was done, but the patient did not survive.

In this case the symptoms of cholelithiasis were not marked, yet they could not be disregarded.

**CASE III.**—Chronic gastric ulcer. Partial stenosis of the pylorus. Gastroenterostomy. Recovery.

Mr. J. W., aged 28, consulted me first in December, 1903. Five years previous he had an attack of jaundice, not accompanied with acute pain, or fever. No gallstones were recovered from the feces. At the time of consultation he complained mostly of nausea and vomiting which could be controlled only by the use of the stomach-tube.

In the course of the examination, the stomach was found two inches below the umbilicus. The stomach contents were always hyperacid. Otherwise, the physical signs were normal. Under appropriate treatment, the patient recovered and remained well for one year, after which the symptoms returned. The stomach was again dilated. The usual treatment did not give relief. A gastroenterostomy was done by Dr. E. S. Montgomery, in February, 1905. The base of a chronic gastric ulcer was found near the pylorus and slight peritoneal adhesions were present. It is highly probable that the few adhesions occurred during a previous ulceration, made pressure upon the common duct and caused the attack of jaundice.

These cases show how confusing the complications of gastric ulcer may be. It is not the purpose here to refer to the complications of cholelithiasis which simulate the symptoms of gastric ulcer, though it is a subject of equal importance and interest.

In reviewing these cases and others in which operations had been done, one is impressed with the misleading of the symptoms, especially when a careful history cannot be, or at least, has not been obtained. The history is of the utmost importance and in some of far greater importance than the physical examination and all the chemical tests known or available. In these confusing cases, it is a common

experience after an operation or an autopsy to be able readily to interpret the symptoms after a little more careful and direct questioning of the family or friends of the patient, and it is also common to find oneself amazed at his own stupidity in not having diagnosed the condition more nearly correct.

The history, of course, is not everything, but it is no exaggeration to say that it may often be nine points of ten possible or necessary ones to establish a diagnosis.

The conclusions which can be drawn from the facts I have mentioned and the cases reported, are:

1. The diagnosis of uncomplicated gastric ulcer should be made without difficulty.
2. When complications exist, it may be impossible to form an exact opinion of the pathologic condition in this region of the abdominal cavity before a laparotomy is done.
3. A careful and methodic anamnesis in these cases is of the utmost importance.

## **FLATFOOT; A MECHANICAL PROBLEM SOLVED BY AN IDEAL PLATE, SIMPLY CON- STRUCTED AND ALLOWING NAT- URAL MOTION TO THE FOOT.**

BY

J. E. TUCKERMAN, M. D.,  
of Cleveland, O.

The two arches of the foot, one, heel to toe, longitudinal, the other, outside to inside the ball of the foot, transverse, are thus classically described by Sayre:

"The foot as a means of support, rests upon three buttresses: The heel behind, which is stationary, and the first and fifth metatarsophalangeal articulations in front, which are slightly movable, capable both of expanding and extending, thereby increasing the base of support, which adds to the security of the body, and by this very expansion and extension of the anterior pillars, or buttresses, gives elasticity in locomotion.

"Between these pillars or points of base, spring two arches, one from the heel, reaching to the anterior two pillars, narrow behind, and wider in front, called the anteroposterior arch; and one from the two anterior pillars arching across the foot, called the transverse arch. The anteroposterior arch is higher on the inner than

on the outer side, and cannot be brought to the ground in the normal condition of the foot, whereas the outer line of this arch is always brought to the ground whenever the weight of the body is borne upon it." (Practical Manual of The Treatment of Clubfoot, Lewis A. Sayre, p. 16, pub. 1875.)

Flexion and extension is the *only* motion possible at the ankle-joint proper (*i.e.*, at the tibiotarsal joint). The changes which we consider in flatfoot can, therefore, only occur at the mediotarsal joint described by Sayre as "going completely across the foot, perfectly dividing it into an anterior and posterior portion, admitting in a limited degree of every variety of motion—flexion, extension, abduction, and adduction, as well as rotation inward and outward upon the long axis of the foot," (*ibid*, page 15); and at joints anterior to it.

The arches are held together by ligaments and fascia and supported during strain by tendons and muscles, of which latter the greater bulk (and more important for our consideration) are placed along the inner side; the lesser bulk along the outer. The relations and actions of the tendon of the flexor longus hallucis should be noted<sup>1</sup> because of the way it bridges the inner edge of the anteroposterior or longitudinal arch when weight is borne upon the toes, for here pressure must be avoided, and because between it and the outer division to the little toe of the tendon of the flexor longus digitorum is a space (corresponding to the cup in the hollow of the hand) in which motion is at a *minimum* and pressure may be exerted without injury—a cardinal point. (The cuts in texts do not give the proper relief to show this, but a dissection will convince anyone. The relation of the internal and external plantar nerves to the heel should also be noted, for here, too, pressure is not only useless but must be avoided.

In walking, the force applied upward at the heel by the tendo-Achilles is transmitted through the foot and applied to the ground by the ball of the foot. Normally the center of the knee, heel, ankle, and second metatar-

sal lie in the same plane (during heel-to-toe progression). The head of this second metatarsal is the pivotal point in the ball of the foot, for in turning to the outside while stepping on the ball of the foot the second and remaining little toes grasp the ground—while in turning to the inside the second and great toe receive the burden.

The longitudinal arch being highest on the inner side, if it be sunken the main drop occurs inward at the mediotarsal joint; the heel and posterior third of the foot remain in the plane but the anterior two-thirds is rotated outward, until the whole ball may fall outside the normal

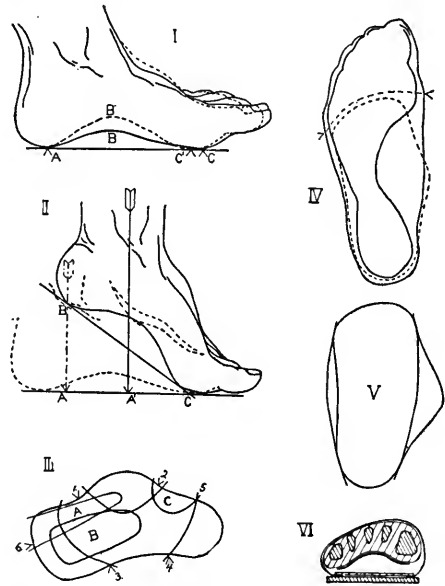


PLATE I. Fig. I.—Foot with arch depressed, full lines; arch raised, dotted lines. Fig. II.—Foot at rest, normal, dotted lines; heel raised, full lines. Figs. III, IV, V, and VI.—Explained in text.

plane, and the distance from the heel to the ball of the foot is lengthened. (Plate I, Fig. I.) This lengthening places additional strain on the supporting structures (tendons, muscles etc.), tending to still further stretch them, and increases the force necessary to raise the body-weight onto the ball of the foot. The difficulty is increased further by the eversion so marked in flatfoot (note "toeing out") which, by throwing the ball of the foot outside the normal plane, adds to the mechanical disadvantage and puts unusual strain not only on the arch,

<sup>1</sup>See Morris' Anat., Arches of Foot, page 1256.

but on the calf, thigh, and back muscles in their endeavor to maintain balance. (Note bending at knees and slight lordosis in these cases.) Hence the pain so often complained of in the arch of the foot and in the small of the back. I doubt its being due to nerve stretching as recently suggested by a certain neurologist.

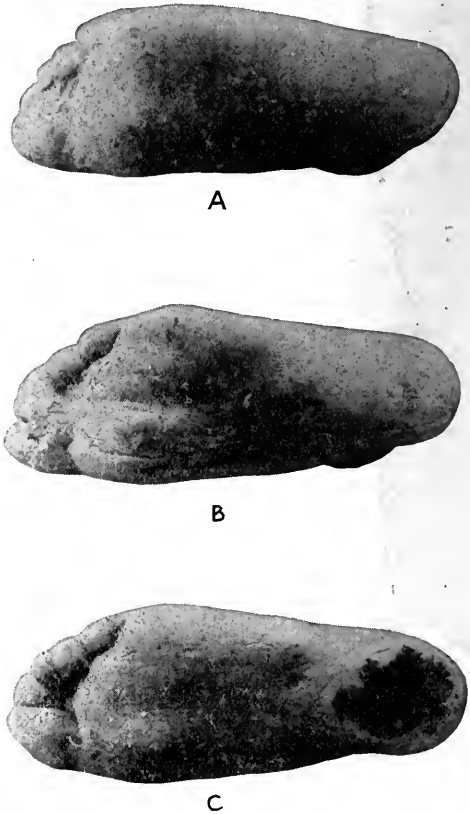
In standing, the weight upon the arch is applied to the ground by the heel and the *inner* and *outer* metatarsophalangeal joints (the pillars described by Sayre). Normally the body-weight bears at right angles on the arch above, and the greater part is distributed to the heel, the lesser falling to the ball of the foot (Plate 1, Fig. II, dotted line), if a lift be placed under the heel (as in wearing a high-heeled shoe) most of the weight will be shifted to the ball of the foot (Plate 1, Fig. II, full line). The main weight thus falling to the transverse arch, the longitudinal arch is relieved of the strain sustained in the normal position (with heel on the ground) since the body-weight is now applied in part lengthwise and not wholly crosswise to it.

This explains the temporary relief experienced from high-heeled shoes. But at what cost? The transverse arch now receiving undue and unnatural strain lengthens and ultimately breaks down. The foot *widens*. Hence Morton's toe, painful calluses on sole of foot and on toes, some types of hammer-toe, etc. From these tight shoes give temporary surcease but often set up inflammations; bunions, bursites and even open sores over the big and little toe-joints, particularly in those with lowered resistance to mechanical insults, as diabetics. Overriding and wedged toes usually follow, as the ultimate result, for, now, whether high-heeled and tight or low-heeled and loose shoes are worn, the exaggerated shucking backward and forward motion inevitable with weakened or broken longitudinal and transverse arches tends to drive the toes further and further into the points of the shoe. Patients usually remark that, tight or loose shoes, their trouble is the same.

The one relief offered is insole plates. The

correction must be by support from *below*. All methods and endeavors to force in the navicular are wrong. Proper support of the arch from below will return that bone to its place. Rigid plates, solid inserts and the like are a damage, jarring the spine. The ideal plate in the ideal shoe is attainable. A broad-based shoe is best but in mild cases the patient may be allowed to follow the follies of fashion.

The ideal plate should embody the following essentials: It must be self-retaining (no flanges



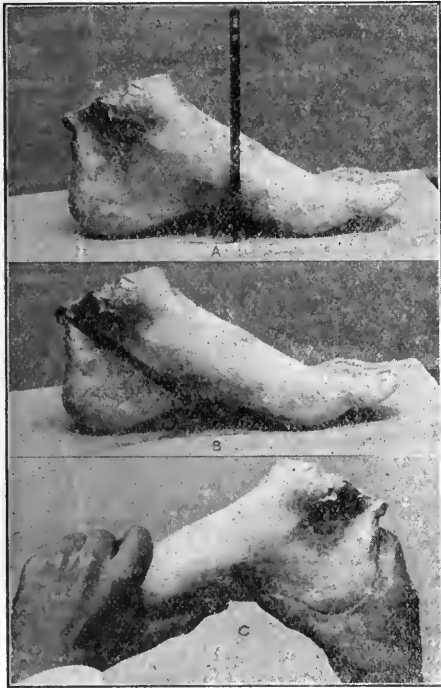
PHOTOGRAPH 1.—A. Cast from bandage mold. B. Cast by Whitman's method, divided mold. C. Cast from impressed mold.

NOTE: The casts represent the same foot; the variations are due to the variations in the method of making.

or other retaining devices are necessary except in rare instances when we are not dealing with simple flatfoot). It should fit as neatly as a dental plate. It must approximate the natural spring of the arch of the foot; must not inter-

fere with the tendons or nerves, or muscles under the foot, nor impede the foot's motion. Must be elastic, light, strong, nonrustable, must have simple method of fitting and be easy to alter or adjust. Must be easy on shoes; must not show; must be reasonable in price.

Of the various materials employed celluloid, rubber, copper, bronze and others have been discarded. Steel, galvanized, japanned, enameled, tinned, silver-, nickel-, or copper-



PHOTOGRAPH 2.—A and B. Method of taking tracing for ordering plates. C. Method of testing the elevation the arch will allow.

plated will flake, rust and otherwise misbehave. Leather coverings get foul; varnish, lacquer, oil silk, etc., as coverings fail. But above all, no such plate either covered or uncovered can easily be altered or adjusted. They are not and cannot be made ideal. Hard rolled German silver 18 percent nickel, grained lengthwise, gauge 18 stubbs meets this requirement, and more, the foot leaves an imprint on its polished surface which can be easily interpreted and the plate adjusted thereby—usually without seeing the patient.

Making of plates over stock dies, or metal casts, or from lead tracings or patterns, or from an old worn shoe may be dismissed as inaccurate. The most universally recommended method is to follow a plaster cast. This method is inherently faulty. If the cast be taken from a mold made by pressing the foot into a tub of plaster, the soft tissues are invariably so distorted as to make accuracy impossible (Photo 1, Fig. C). The foot is taken in its flattened position and no skill of adding to or taking from can make it accurate. A cast from a mold made of a bandage applied to the foot and removed after hardening has similar faults. It rather heaps up the soft tissues (Photo 1, Fig. A). Or were the cast made by Whitman's admirable method, are we better off? (Photo 1, Fig. B.) Assume the cast perfect. If we endeavor to correct the cast by cutting away until the desired elevation say at the position B' (Plate 1, Fig. I,) is reached we cannot shorten the distance AC which remains unchanged. Evidently a plate which fits the corrected cast must be too long for the foot in its new position. For to raise the arch from B to B', A remaining fixed, C must recede to C' often a distance of half an inch (see Fig. II). Let us be frank, most casts are inaccurate. No cast can be accurately corrected. It may amuse the patient, get his dollars, dirty our fingers (if not our souls), but even if we do not shrink from fooling the patient let us not deceive ourselves.

Plates can be made according to tracings which are simple, require little time of the patient or physician and are more accurate than other methods. Let the patient, while seated, place both feet on a sheet of paper, trace the outline of the projection of the foot, the pencil held perpendicular to the paper and touching the foot (Photo 2, Fig. A). Then repeat, allowing the pencil to trace under as far as possible (Photo 2, Fig. B). This gives the tracing of the foot at rest (*i.e.*, light). Change the paper and repeat with the patient standing. This gives tracing while sustaining the body-weight (*i.e.*, weighted). Take weight of patient and size of shoe. Note position of cal-

luses, inflammation, etc. These though not so essential aid the mechanic who fills the order.

If the foot is normal the outline remains practically unchanged (except for a slight spreading of the flesh) whether "weighted"

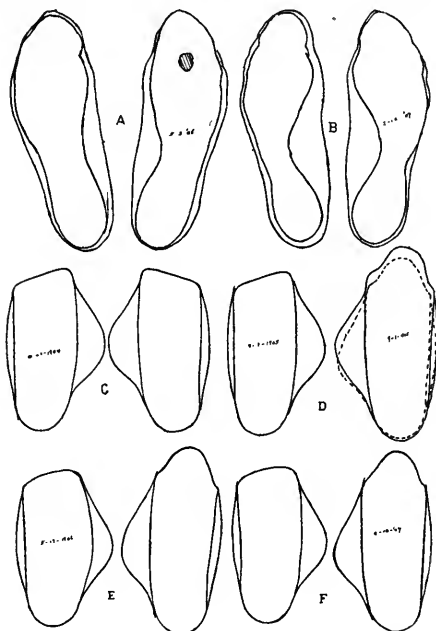


PLATE 2.—Fig. A, Tracings "weighted" taken June 3, 1906. B, Same "weighted" taken Feb. 14, 1907. C, "Record tracing" of first plates worn, Oct. 1, 1904. D, Full line, plates as modified Sept. 1, 1905. Dotted line F, superimposed on D: E, June 17, 1906. F, Feb. 14, 1907. The long plate is the modification applied for severe Morton's toe.

or "light." Fig. IV, Plate 1, shows a normal tracing. The outer line from the heel to the big toe is practically straight and the inner line swings in markedly showing a good arch. The low arch and spreading under weight is shown in Plate 3, Figs. III B (tracing "light") and A (the same "weighted"). Fig. C shows the same "light" with a "record tracing" of plate to fit. In Plate 3, Figs. I A, "weighted" we have a more marked case, showing the eversion of the anterior two-thirds of the foot. The line on the outside from heel to big toe is quite convex. The straight shaded portions indicate calluses; the curved, bunions; and the circle, a corn. B "weighted" shows the same after plates had been worn five and one-half months. The arches are improved and the

calluses and bunions gone; the corn remains. C shows "record tracing" of the original plate worn (heavy lines) and the plate as modified (dotted lines). This was made necessary by the improvement in the arches and consequent shortening of the feet. Similar improvement in the arches is shown in Plate 2, Figs. A, B, and D after about nine months. (Unfortunately the earliest tracings were lost.) Plate 3, Fig. II shows an extreme flatfoot with total loss of arch, the navicular projecting equally with the internal malleolus. This bone could be wholly returned by the pressure of a plate raising the arch from below.

Having selected the gauge of metal according to the weight of the patient, a blank is cut ac-

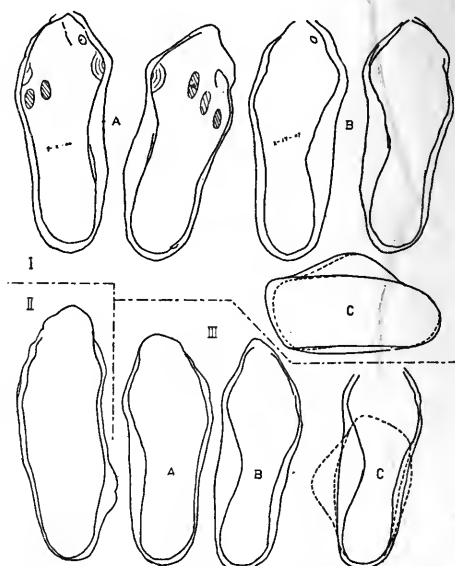


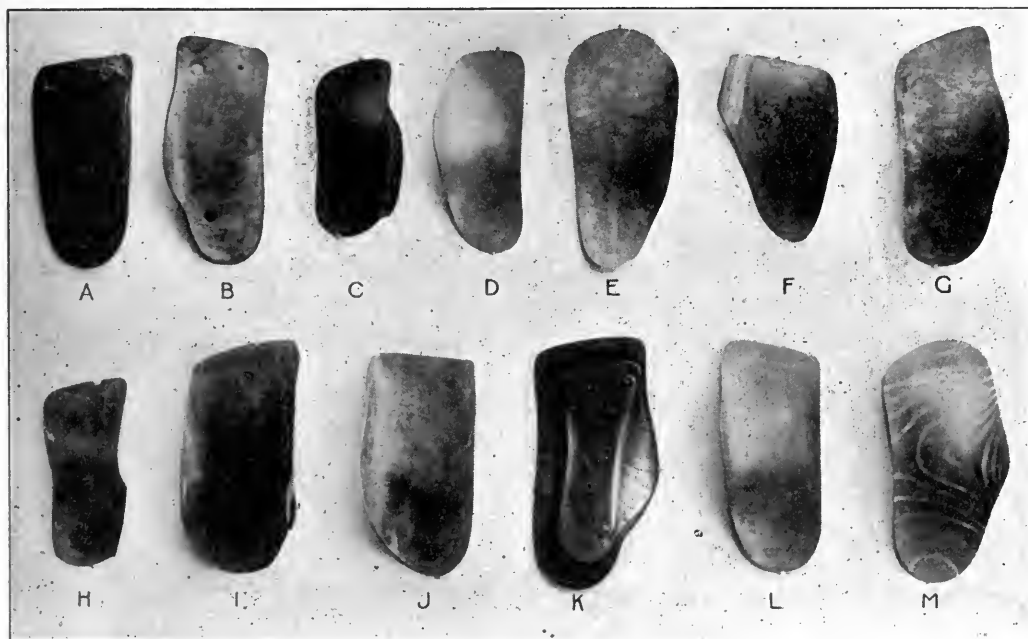
PLATE 3.—Fig. I, A, Tracing "weighted" Sept. 2, 1906. B, Same "weighted" 5½ months later Feb. 17, 1907, arch improved. C, "Record tracing" showing shortening of plate. Fig. III, A, Tracing "weighted"; B, Same, "light"; C, tracing of plate to fit superimposed on B. Fig. II, Explained in text.

cording to the diagram. Plate 1, Fig. IV, dotted outline, shows the approximate shape of such a blank. It is essential that the plate lie just short (about one-fourth inch) of the centers of the metatarsophalangeal joints (position indicated by darts and dotted lines) to allow for free motion after the weight has been carried to the toes, and it should be no wider at the

front than the distance between the centers of the outer and inner metatarsals (Plate I, Fig. VI). Photo 3, M, shows the plate shaped from the blank above; and Fig. V, Plate I, shows its "record tracing." This record is made by tracing the projection of the plate and then tipping it, first on one edge then on the other, which gives the height of the flange on the inner side (right) and the elevation of the sole of the plate on the outer (left). Such record

The density of the metal is kept as equal as possible by working evenly over large surfaces. Parts carrying strain are left thick and the shaping accomplished by working the metal elsewhere. Reference to Plate I, Fig. III, will help to explain this.

Points 1, 2, 3, 4 in the order named sustain the greatest strain and are most liable to break. The metal is not touched at these points or in their neighborhood. Area A is depressed.



PHOTOGRAPH 3.—A. Leather covered plate made to order, N. Y. B. and I. The common "stock" plates. C. Copper-bronze plate; high-flanged and rigid, Cincinnati. D. Plate made over a die. No provision for transverse arch. Flange elevations the same front and rear, Chicago. E. F. and J. High-flanged plates. H. Silverplated, showing rusting. K. "Stock" plate *absolutely* rigid. L. First form of plates made by Vrbsky. M. Present "ideal" form showing contour lines.

enables the physician to follow the progress of the case and the mechanic to reproduce at will any plate made.

Relying on the chart which gives the amount of flattening, knowing the general anatomy, where pressure can and cannot be made, will and will not avail; the plate is shaped and drawn on the anvil from the flat metal cut according to the diagram (Plate I, Fig. IV). The method used is "peneing" similar to making beaten metal dishes in copper art work (*i.e.*, striking with the "pene" of the hammer).

to avoid pressure and interference with the action of the tendon of the flexor longus hallucis (see anatomic discussion). B is raised to fit the cup of the foot and is the *crucial* point as this elevation B and depression A cause the foot to grasp the plate and no flanges are needed to keep it from sliding from under the foot. Fig. VI, Plate I, is a diagrammatic sketch of a cross section of shoe, foot, and plate just back of the distal metatarsal heads. The distance between the plate and the upper of the shoe is least in the center, the plate can

slide neither to right nor left. The tendency of most plates is to shove to the inside. This is impossible with a correct plate. Area C is depressed to avoid pressure on both tendon and nerve (see anat.). All anterior to the line 3-1 and posterior to the line 5-4 is tapered to give spring, lightness and natural action to the plate. The anterior end of plate falls about one-fourth inch behind the centers of the metatarsophalangeal joints and falls away on either side from 6, the position of the second metatarsal so as not to impede its pivotal action. The flange is made low and does not force the navicular in but supports it from below. These points which are most essential are neglected in the plates usually made (Photo 3, C, E, F, G, and J). The amount of elevation a patient will stand may be judged by grasping the foot and shucking it together as one might a series of blocks to hold them together (Photo 2, Fig. C).

The imprint of the foot on a plate that has been worn 48 hours or more gives a definite clue to the points of too great pressure or other faults that can be modified in a few minutes by the hammer. No other plate gives a clear imprint and no other substance yet used is capable of such easy modification. Practice enables the mechanic to read the imprint on the plate even more accurately than the tracings (practically with absolute accuracy). Usually not more than one modification is necessary at the first fitting and many do not even require this. However, all plates should be kept track of and be modified every two or three weeks or months to meet the changing form of the bettered foot. A plate correctly fitted along the lines laid down, and modified to meet the progressive improvement in the foot, need not and does not cause the damage referred to by authors whose plates do not meet these essentials. That this plate allows the foot natural motion and aids it to recovery is definitely shown, for the foot actually outgrows the plate and comes to demand for comfort a higher-arched, shorter plate and a narrower, shorter shoe (Plate 2, Figs. A, B, D, and Plate 3, Fig. I, A, B, and C). (In passing we may add the converse of this principle,

*i. e.*, working it backward, giving a contracting foot a long plate, will retard such contraction and aid the patient, C V.).

Though not desiring to discuss special plates, one variety is worth mention. It is the most frequent variation made, and usually Morton's painful toe yields promptly to it. Reference to the diagram (Plate 2, C, D) will explain this. The pain was relieved but not cured until the modified form was adopted.

However, mild cases respond to the ordinary plate.

#### SUMMARY.

Flatfoot occurs according to definite mechanical laws based on anatomic structure and physiologic action and must be treated in accord with these laws.

It is primarily a sinking of the longitudinal arch, with concomitant eversion of the anterior two-thirds of the foot, and subsequent flattening of the transverse arch; complicated by secondary ailments as "rheumatic" or vague pains in arch, knee, or back; corns, bunions, Morton's toes, hammer-toes, etc.

High-heeled and tight shoes afford only temporary relief and aggravate the secondary ailments.

The remedy is a plate made along anatomic lines to support the foot from *below* while allowing physiologic action.

The material best suited is German silver, being easy to work, alter and adjust, and giving on its polished surface an imprint accurately indicating where alteration need be made.

The best method of ordering a plate is from tracings of the bearing surfaces of the foot and not from casts or other time-consuming and inaccurate methods.

The method of shaping the plate on the anvil by "peneing" is so carried out as to insure durability.

The plate is self-retaining, supporting the arch while allowing by its shape, tapered ends, elasticity and accurate fit the necessary condition for ultimate recovery, to natural action of the foot; a spring tread followed by the grasping the ground with the toes as the body-weight is carried over them.

That the constant use of this plate does not damage the foot but aids the upbuilding of the arch is proved by the fact that the foot soon finds the plate too long. With the heel fixed by the shoe, the imprint in time shows the pressure to be confined to the anterior part (areas A and B, Plate 1, Fig. III) and not distributed evenly over the plate as when first fitted. The arch has regained some of its tone and the plate must be modified, raised and shortened and often narrowed. (Vid. Plate 2, A, B, and D and Plate 3, Figs. I, A, B, and C) to meet the new requirements.

*Afterword.*—It was not intended to make this a report of cases. Suffice it to say that by this means, corns, bunions, and painful callosities have been effectually banished; ulcers which formed from pressure on the foot of a diabetic so often as leather shoes were worn were caused to cease and the patient enabled to wear shoes; Morton's painful toe was relieved; the annoyance of a hammer-toe for which a patient sought operation was wholly relieved; certain vague "backaches" in the small of the back, and various kinds of "rheumatism," so called, of feet and knees were cured; even ankylosed flatfeet devoid of mobility have been mobilized and the patient enabled to walk in comfort.

*Acknowledgment.*—For the development of this method and the manner of its application entire credit is due to Mr. Chas. Vrbksy, who has for five years endeavored to solve the problem of plates, their material, and making, and to find a simple method of ordering and readjusting them. In this he has succeeded so well indeed that I would fear to seem over-enthusiastic did I not know the facts are as presented and have been verified in his experience with at least 2,000 cases.

Cognizant of his consummate skill, having had the pleasure of his assistance and suggestion on various devices and in the preparation of this paper, I am pleased to acknowledge his clear insight into the mechanical problems of orthopedics and hope that this paper may further the general recognition of the method he has devised and perfected.

## RADIOTHERAPY IN THE TREATMENT OF MALIGNANCY.<sup>1</sup>

BY

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In considering this subject I shall not attempt to fortify any statements which I may make with statistics or quotations, but will give the conclusions derived from some six years' work, and the beliefs which experience has convinced me are both truthful and rational, and with all, conservative.

The fundamental truth based upon facts repeatedly demonstrated and confirmed by competent observers which is the foundation stone of modern radiotherapy, must first be understood before this branch of medical art can be dignified by any title short of empiric. It may thus be more or less accurately stated, that the radiation from an excited Crookes' tube, when falling upon and absorbed by living animal tissue, acts in small dose as a stimulant, in larger dose as an irritant, in still larger dose it inhibits cellular activity, in excessive dose it produces tissue death. The more highly specialized and less resistant cells suffering first.

Its use in the therapy of malignancy began as rank and irrational empiricism—the natural outcome of the twentieth century craze to apply everything that is unknown, as a remedial agent in incurable conditions. Strangely, however, such application, irrational, empiric, unskilful, though it was, yet occasionally was followed by unexpected beneficial results.

Through repetition, experimentation, investigation, and speculation, the *modus operandi* has been discovered, the dosage formulated, the indications and contraindications distinctly classified and stated, and today the agent is accepted by a large proportion of the profession as worthy of use and of extreme value in the hands of any intelligent physician who will devote sufficient time to perfecting himself in the art of its proper employment to render him qualified.

It is impossible for me to avoid the use of ex-

<sup>1</sup>Read by invitation before the Philadelphia County Med. Soc., January 9, 1907.

pressions regarding this agent that have been used before, and I would state here that I consider it well proved that in the röntgen ray we have an agent possessing a selective, destructive affinity for malignant tissue wherever and however situated.

In order to understand this proposition it is necessary that we consider malignancy in the abstract. I have been accustomed roughly to describe malignancy as "a condition of cell anarchy," by this meaning that in epithelioma, for example, the individual cells manifest a total disregard for physiologic law. They disregard, first, the law of property as evidenced by the ignoring of boundary lines, they push beyond the physiologic margin, they invade territory to which they have no right or title to the displacement and destruction of the rightful residents; second, in disregard to the laws of biology, they increase and multiply at a rate that is destructive to their own support. By such excessive multiplication, is produced degenerate cells incapable of the battle for existence, possessing no power of physiologic resistance, thus we obtain overcrowded centers of population, and excessive deathrate.

It is upon the fact that these excessive new cell formations possess a low physiologic resistance to injury and poor reparative power that the röntgen ray is enabled to demonstrate a selective destructive affinity for such tissue. Inasmuch as demonstration shows that, given two companies of epithelial cells, the one abiding by physiologic law (the so-called normal epithelium), possessing a high degree of physiologic resistance and power of repair, and other epithelial cells which form a part of an epithelioma, disregarding physiologic laws, and in their location, side by side, expose them both to a given dose of röntgen ray, both will suffer, but a dose which in normal epithelium will produce but a transitory irritation scarcely approaching inflammation (resulting perhaps in the death and elimination of a few of the weaker and immature cells), will be followed in the epithelioma by death of many of the cells, with their resultant absorption or sloughing, and their replacement by granulation or scar tissue.

This is the result which is to be desired in the successful treatment of malignant growths by the röntgen ray, but such a result is only accomplished and need only be expected when the proper quantity of a definite quality of the röntgen ray has been absorbed in the tissue, and it explains why the more superficial growths are so easily and successfully attacked whereas the treatment of internal growths becomes progressively more difficult, the larger the growth, the denser the growth, and the deeper it is situated beneath the surface, since in the very deepest growths an enormous quantity of highly penetrating rays must be employed in order that a few should penetrate to the deepest portions of the growth.

Moreover, from any given tube there is emitted, when properly excited a complex output of rays, some of extreme penetration, highly suitable for the treatment of growths deeply seated, others of medium penetration, and still others of slight penetration. By means of the interposition of suitable filters such as leather (after the method of Pfahler), these less penetrating rays may, to a certain extent, be dispensed with, but it is very seldom that a tube is obtained which gives off a high proportion of these rays of low penetration.

Moreover, the radiation falling off as the square of the distance, it is necessary, in the treatment of deepseated lesions, to place the tube at a considerable distance so as to equalize, so far as possible, the effect at the surface with that produced in the deepest portion of the growth, but in spite of all these precautions and devices it frequently occurs that failure must result in the treatment of deepseated conditions, owing to the fact that long before the proper quantity of radiation has been directed to and absorbed by the deeper portions of the growth, there is produced a marked effect, perhaps so marked as to interfere with the treatment, upon the surface.

The treatment of the various forms of superficial malignant conditions is attended in qualified hands with such constantly successful results that my readers are no doubt familiar with just what may be expected, and the

question of the extreme value of scientific radiotherapy in this condition is no longer open to discussion, but the one thing needful of consideration is the method of employment and the contraindications.

In the treatment of superficial lesions a tube of low vacuum giving rays of penetration just sufficient to reach the lowermost confines of the growth is proper. The apparatus used to excite the tube need only have sufficient capacity to excite it properly and be free from the evils of inverse discharge. The surrounding healthy tissue must be protected by material which is opaque to the rays, or one of the modern lead glass tubes may be employed which irradiate only a given area.

European practice advocates the administration at a single sitting of a massive dose of röntgen ray, more or less inaccurately measured, followed by a long interval of rest. This method while pretending to extreme accuracy I consider dangerous and unscientific. It assumes the possession of an accurate means of measuring the rays. It ignores a most important and troublesome factor, idiosyncrasy, and the dose once given can never be recalled. I know of no emetic for röntgen ray and it is better to be safe than sorry.

Moreover, in the administration of massive doses resulting in metabolic changes of magnitude, a tremendous overload is thrown upon emunctories which is sometimes followed by decidedly unpleasant results and for this reason, in this country, the majority of operators of experience prefer the step by step to the plunge in the dark.

Following the administration of graduated doses at frequent intervals, in epithelioma for example, the discharge if present, is at first increased, finally suppressed, granulation begins and a smooth, pliable, and scarcely noticeable scar replaces the malignant tissue. Here, as elsewhere, the greatest value of the ray is shown in those conditions less favorable for successful surgical removal, and the cosmetic results are excellent. Epitheliomas in and about the alæ of the nose, on the eyelids, and about the eyes, are successfully treated with

freedom from recurrence and cosmetic results that are extremely satisfying to the patients.

Great good has been accomplished in the treatment of carcinoma, and yet, the treatment of this class of patients by certain men has cast much discredit upon röntgen-ray therapy which it will take years to remove. Hundreds of cases absolutely unsuited for this treatment have been submitted to it by inexperienced physicians with resulting disastrous results, such men being apparently ignorant of the fact that definite contraindications exist against the employment of any therapeutic agent.

Further, the attempt to employ the röntgen ray as a substitute for surgery under all circumstances was based upon fallacy, the direct result of ignorance of the physiologic action of the rays, and the manner of metastasis of this disease. Certain cases of circumscribed self-limited scirrhus of the breast disappeared more or less completely after exposure to the röntgen ray, whereupon these men hailed the röntgen ray as a specific in carcinoma wherever and however situated.

No one will deny that water will put out fire, yet water will often fail to put out fire in a coal mine, and no one would use it to put out a fire of oil or burning sodium. Water will put out fire, therefore, sometimes, when you can get it on the fire, and the röntgen ray will cure carcinoma when you can get it on the carcinoma.

The best treatment for carcinoma consists in the removal of all of the carcinoma from the host, and in every carcinoma there is a period during which this is perfectly feasible, and when such operation is performed metastasis or recurrence cannot and will not occur. Every carcinoma for an indefinite period is a local circumscribed disease and if situated in an accessible position can be completely and successfully extirpated surgically. Later when metastasis has occurred the problem presents an entirely different aspect; therefore, the treatment of carcinoma in any location depends upon its accessibility and the period of the cycle in which we find it.

It is undoubtedly true that many primary

circumscribed carcinomas have been, can be, and will be successfully treated by the röntgen ray alone, but I very much doubt the wisdom of such treatment unless there is present decided contraindications to the method of well-tried surgical procedure. Personally, I do not care to undertake the treatment in any case of malignant disease unless with the hearty co-operation and consent of a competent surgeon of experience. By far the preferable, the safer, and to me the more rational procedure, consists in the combination of that which we know with that which we believe to be good.

Since it has been demonstrated that the röntgen ray possesses a selective, destructive affinity for malignancy wherever accessible, the proper procedure, unless the growth be a rapidly progressive one and every day counts, is to submit the patient to a series of antioperative radiations (from five to sixteen sittings) followed by a radical extirpation of all infected tissue and during the convalescence a series of postoperative radiations should be begun and carried on to such time as the judgment of the radiologist dictates, thereby disposing of all malignancy which may perchance have escaped the eye and knife of the operator. In such procedure, I see nothing to condemn and everything to praise, and I firmly believe that the future will see these methods employed as a routine measure. Careful unbiased observation of it for three years has convinced me of its extreme value and I believe it to be the duty of every right-minded physician who has the interests of his patients at heart, to insist upon the employment of the ray before and after operation for malignancy.

Certain objections, it is true, have been advanced to its employment in this connection but these objections are theoretic, not practical, and they are usually based upon a tottering tower of reason founded upon a false premise. It has been claimed that cases submitted to operation following such radiation were excessively difficult, due to the obliteration of surgical landmarks, the matting together of the tissue by inflammatory products, etc.

Ten antioperative radiations I will guarantee, to produce no such effect, in fact if the operation be performed the day following the tenth treatment as it should be, I defy any man to determine by macroscopic examination of the tissue that anything has been done. Any changes that will have occurred are microscopic, not gross. There will not even be manifest, a sensible diminution in the size of the lymphatics or glands. Neither will the nutrition of the flaps be interfered with unless the flaps have been so illy planned that an unusual degree of tension is produced by the approximation sutures. Following the operation the radiation, if properly administered, will not interfere with the healing of the wound.

The fact that some of our most conservative and skilful surgeons have already adopted this treatment as a routine measure in their work is, to me, the best evidence of their belief that it is worthy of consideration.

The removal of a breast containing carcinoma when examination has revealed infected lymphatics in the axilla, if not preceded and followed by a course of röntgen-ray radiation, I am obliged to term a palliative operation only.

In another class of cases in which the metastasis is already so extensive that operation is resorted to without much hope of ultimate cure, the adoption of this method will result in a perceptible betterment in surgical statistics. So thoroughly am I impressed by the actual value of this method, that I am forced to plead for its investigation and trial by surgeons.

The position of the röntgenologist in this matter is a peculiar one; on the one hand stands the public and a large proportion of the medical profession, demanding that we accept and treat these patients with the ray alone; while we insist that such is not the proper procedure and this is, the ground taken today by practically all reputable röntgenologists. We do not permit isolated brilliant results in certain selected and appropriate cases to blind us to the fact that the overwhelming majority of these cases must and shall have the benefits of the best surgical procedure.

Moreover, in the last year I have seen in common with all other men of much experience, a wonderful increase in the proportion of patients with early and favorable cases of carcinoma who present themselves for examination. Four years ago an operable carcinoma in my office was a rarity, today they are pleasingly common.

Such patients submit themselves with complacency to operation when assured that the best course of treatment is antioperative radiation, radical extirpation, and postoperative insurance against recurrence.

I have been decidedly impressed with another fact, namely, that the period during which carcinoma remains a local disease, is an absolutely unknown quantity, depending not upon the microscopic, but upon the clinical malignancy of the growth under question, combined with another factor of extreme importance, namely, the individual resistance of the patient's tissues to the invasion of the disease.

Within the month I have observed a carcinoma of the breast present for six years, which showed upon examination not the slightest evidence of metastasis, yet it was undoubtedly carcinoma, as shown by operation. Another case which presented a seeming innocent cystic growth of the breast in a woman of 42, with no evidence of axillary or other involvement, upon operation showed beginning involvement, gross, of the axilla and a cyst communicating with the nipple, having thickened, frankly carcinomatous walls. This case had a duration of but a few weeks and metastasis began almost coincidentally with the development of the growth.

In the first case the patient would have made a spectacular recovery under röntgen-ray treatment alone. The second case would probably have resulted in bitter disappointment. The first was microscopically malignant, yet clinically of feeble malignancy. The second possessed a degree of malignancy usually expected in sarcoma alone.

I wish to call attention to the dangers of permitting ourselves to consider dubious tumors of the breast as probably innocent, when we are unable frankly to designate them malignant.

The place to determine the innocence of a tumor of the breast is in the pathologic laboratory after the breast and not a specimen has been removed.

In frankly inoperable cases much can be accomplished by the combination of surgery and the röntgen ray. Life may be prolonged, discharge lessened or dispensed with, pain relieved, and the patient's frame of mind made much happier. Some of my most grateful patients have been those who could see nothing ahead but a few months of pain, and a miserable and disgusting death. Yet, to some it has been permitted to enjoy one or more peaceful and useful years, which result is not to be despised.

What we need, and what we plead for, what we must have, and what we expect, is not the antagonism, but the cooperation of the surgeon, the kind of cooperation we shall obtain when they see that we present not a substitute but a new and useful weapon. For the many wrongs that have been done in the name of röntgen ray, no excuses can be made, but none need be made, for I believe that an investigation of the work that has been done by the best röntgenologists will meet with the hearty commendation of the entire profession.

I am daily asked what can be accomplished, and what may be expected in the treatment of internal malignant growths. In such conditions I regret that nothing can be promised yet, beyond a strong probability of relief of pain, more or less complete, and more or less temporary inhibition of the growth. This is not due to the inability of the agent to effect the growth but to the inability of the operator in the present state of the art to apply to the growth such quality and quantity of radiation as shall be found effective before such time as an undesirable effect is produced upon the surface overlying the growth.

I have seen the radical operation for the removal of primary carcinoma of the breast so skilfully and carefully performed as to arouse my admiration of the operator, and the operation seemed so complete, so perfect, so radical, that recurrence could not occur, yet a few

months or years showed the patient almost hopelessly infected again by the disease. I know that all that human skill could do had been done at the operation and the thought could not be driven out that the disease was not all removed because it could not be discovered by inspection of the tissue. Why not use the röntgen ray to destroy the immature carcinoma remaining after operation, thus completely sterilizing the entire chest, neck and axilla?

The only arguments against it are, (1) it is not an absolute preventive even when intelligently employed in every case; (2) it costs time and trouble; (3) it appears like a confession of the inability of the surgeon to perform a complete and successful operation; (4) patients have been burned by incompetents; (5) it is new and theoretic; (6) it is using something intangible to destroy something which we only suspect to exist.

However, in spite of these weak objections, I say that in every case of carcinoma the patient must be offered or refused the benefit, real or imaginary, of the method described, and the direct responsibility of the decision rests upon the attending physician.

Finally success or failure is directly dependent upon the skill and experience of the radiologist employed and the agent should not be blamed for the shortcoming of the operator.

### WHAT IS THE PRIMARY CAUSE OF MAL-LEGISLATION AND NON-LEGISLATION WITH REGARD TO MEDICAL MATTERS?<sup>1</sup>

BY

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All doctors are, I think, agreed that very much is awry and even positively lacking with regard to legislation in this country concerning medical affairs. The defective, indeed the deplorably defective, condition, is not confined to any special locality, or to any particular grade of law-making. It exists in Maine and in California, in New York City and in Tic-Tac,

Idaho. It is found in the proceedings of municipal assemblies, and as a result of the deliberations of county supervisors.<sup>1</sup> It is not absent from the laws framed by our august State deliberative "solons," and it often appears within the heavy tomes which bear the name of the great United States.

Now what is the reason why these things are so? What is the cause of all this legislative amissness and defectiveness? Is there not some single central operative agent, some one, basic, underlying, vicious condition, which, once removed, or very much improved, would set aright, at least in great measure, the astounding, the overwhelming, maze of detail that goes to make up the undesirable medical legislation and lack of legislation in the States and in the United States?

To me it seems that there is such a single, central, primary trouble, and that central cause, that primary difficulty, I desire, at the beginning, to name. In a word, it is this: The absurd the ridiculous, the absolutely unutterable character of the instruction (more commonly it is the total absence of instruction) which is given on legal medicine and allied topics today in American schools of law. There are, of course, among the schools, some rather remarkable exceptions.

You remember the antique classic of our childhood: "This is the cow with the crumpled horn, this the maiden all forlorn," etc., etc. —one thing causing another till the point where the final result of the series of causes, or at least relationships, is reached. So it is in regard to vicious medical legislation, viewed as the ultimate effect of faulty teaching in the law schools. Who make the laws? Our legislators. Who are our legislators? To all intents and purposes, our lawyers. Who make our lawyers? Our schools of law. (Formerly a copy of Blackstone and a dusty office: that day is gone.) When, if at all, do our legal brethren attain to medical concepts? While in their schools of law. As a fact, do they there attain to medical concepts,

<sup>1</sup> Read before the American Academy of Medicine Atlantic City, N. J., June 4, 1907.

<sup>1</sup> I refer, of course, to the attempted legislation of these ordinarily not too well-instructed bodies.

or at least to any of value? They certainly do not. Do, then, our lawyers pass laws concerning medical matters in well-nigh total ignorance of the subjects concerning which they legislate? Most undoubtedly they do.

"But," says some one, "medicine, in this world where time is fleeting, is an art too long to be learned by those who expect to practise something else than medicine."

The answer is that no one would expect an embryo lawyer to study medicine in anything resembling its fullness and completeness. All that the student would need to do would be three things: First, to acquire what may be called the fundamental medical concepts—*viz.*, ideas of the nature and functions of the organs of the body, ideas of the nature of disease in general, and ideas of the commoner medical and surgical affections in particular; second, he should study forensic medicine—*i. e.*, such medical facts as are oftenest required to assist in the administration of justice; third, State medicine, or such medical facts as relate to public hygiene, to medical education, to surgery and medicine as employed in the army and navy.

After such a course, were it given in the proper manner, the graduated lawyer might, to be sure, seeing that he would not engage in the practice of medicine, promptly proceed to forget his medical facts, even to the very last one of them. But, even then, something would remain—something of the scientific attitude of mind, something of medical ways of looking at things. Any course of instruction that is worthy of the name inevitably does a great deal more than merely introduce into the mind a deposit of information. It alters the mind's texture, gives to the mind new qualities and characteristics. And medical qualities, medical characteristics—these are the things which, if lawyers only took such mental attributes away from college with them, would alter the character of medical legislation in the United States all the way from the bodies that assemble in Washington clear down to the tiny town meeting.

What is the actual present condition of legal medicine in American schools of law?

Listen to the facts. Out of 57 colleges to which I wrote, I found but seven giving, or even professing to give, a course in legal medicine. Of the courses that are given, some, as one can readily perceive, are the shabbiest of humbugs. One school declares with pride that a "course" of seven lectures on legal medicine is given to all its students. Then it goes on to say that attendance in this course is not obligatory, and that no examination on the subject is held.

What wonder is it that, not long ago, an attorney—he is a learned man, and one, too, who has sat in the legislative halls of the State of Illinois—soberly remarked to me that only one cure existed for thrush, and that that was to have some person who had never seen his own father, blow his breath in the child's mouth? This attorney is a law school man.

What wonder that medical laws are ineffective? What wonder that they are vicious? What wonder that each new medical fake finds everywhere some legislator to espouse it, to make much of it, to glorify it to the heavens? I know of lawyers who have sat on appellate and supreme benches, who nevertheless employ for themselves and for their families nullapaths, vitapaths, physiomedics, Christian scientists, chiropractics, and all the rest of that tribe and ilk of study-dodgers, believing that the sole differences existing between the various "schools" are simply the natural, the inevitable, in fact the highly desirable, differences of opinion which normally obtain among the members of the body scientific.

Had the attorney whom I have just mentioned been taught even only a little of the elements of general medicine, then of legal medicine, and, finally, of State medicine, and taught them in a scientific, though of course perfectly simple and interesting manner, he would never have broached the subject of his peculiar therapy for thrush. And he would, too, have been a better medical legislator.

Incidentally, I must touch upon (though nothing more than touch upon) the deplorable condition of medical jurisprudence as taught today in our schools of medicine, with their

four and five-year courses. In some of the medical colleges not one single hour is given to this extremely important subject—this subject which, in a practical manner, impinges upon human interests by all of its thousand sides, and yet these identical colleges are giving scores upon scores of hours to pathologic anatomy and unproved theories of immunity. In some of the medical schools, a lawyer is called in to deliver a “course” of three or four lectures on the subject of legal medicine, apparently as a matter of compliment to the lawyer. In still other schools, the subject is divided and passed round among the various chairs of systematic medicine. The jurisprudence of obstetrics is given to the professor of obstetrics; the jurisprudence of surgery, to the professor of surgery; and so on. Such an arrangement leaves the law side of the subject out entirely in very many instances. It also omits certain divisions of the medical part of the subject (like personal identity) which do not fit in well with any particular branch of systematic medicine. Such parts of the medical side of the subject as are retained among the regular chairs, are treated, necessarily, by men who do not, and cannot, view their subjects with a legal eye, or expound them correctly in their numerous legal relations. The effect on medical jurisprudence of all the chopping up and passing around is much like that which a certain homely award of arbitration had on an unfortunate dog. The dog was claimed by a number of persons. According to the award, the poor fellow was to be divided up and passed around among his several claimants. And the dog was actually so divided, and so distributed. But the dog died. Now, the dog was correctly divided, in theory at least; of that there can be no doubt. But the life went out of him. And the life goes out of medical jurisprudence when that subject is divided up and passed around. Medical jurisprudence is worth scarcely more than a dead dog when the life—which is the law—is gone out of it. And the law does go out of it necessarily whenever it is placed exclusively in the hands of doctors. It is then no longer

medical jurisprudence, but only medicine, only the medical carcass of medical jurisprudence. The doctor who thinks that there is nothing more to even only the medical side of medical jurisprudence than medicine, will likely some day, on the witness stand, awake to a realization of the fact, for example, that a very great difference exists between insanity in medicine and insanity in law, and must from the very nature of things continue to exist.

Now what has all this about teaching medical jurisprudence in medical colleges to do with the teaching of medical matters—medical jurisprudence included—in law schools? Simply this: When doctors themselves so little understand the importance of legal medicine that they cannot teach the subject in a worthy manner in their own schools, with plenty of time in which to do so, what can they expect to be done with the subject in a three-year school of law? And if the subject be not taught (as it certainly is not taught) to any extent whatever in more than seven law schools out of 57, then how much hope is a sane man justified in entertaining that medical legislation will ever become intelligent and wise and safe and sound and sensible?

Returning to the law schools: How should the student of law be taught the things which we have said he ought to be instructed in? First, his study of the fundamental medical concepts and of State medicine, should be carried on apart from similar work being done by students of medicine. No matter if the law should be in the closest affiliation with a medical college, this work should be done by the law students apart and to themselves. The reason is that all this work should be very much briefer and simpler than similar work being done by medical students. Legal medicine is an altogether different matter. That study should, when possible, be pursued together by students of law and students of medicine and even in the very same room. Thus, incidentally, would come about a better understanding of lawyers by doctors and of doctors by lawyers.

The teacher of medical jurisprudence, whether in a school of medicine or in a school

of law, should, ideally, be a graduate in both medicine and law. A graduate in both law and medicine may, as a fact, be a very poor teacher of medical jurisprudence; nevertheless, the teacher of medical jurisprudence should, as at least an elementary qualification, be educated in both sides of the subject which he professes to teach. Upon this matter of twofold education of the teacher, as part of an ideal condition, there cannot be placed too strong an emphasis. Doctors struggling to teach law and lawyers struggling to teach medicine are not very edifying spectacles, howsoever strongly they themselves may think to the contrary. In fact, the most important result to be attained from the study of legal medicine is not, on the one hand, the power of legal vision, nor yet, on the other hand, the power of medical vision, but rather the power of stereoscopic vision, the faculty of medico-jurisprudential eyesight. The power to view legal matters medically and medical matters legally (just as the right eye sees the visual field under the criticism and conditions of the left eye, and the left eye sees the field under the criticism and conditions of the right eye) this is the important matter. No one-eyed man, be he right-eyed or left-eyed, ever sees the world in the true, the binocular, manner. Ordonaux—whom we all delight to honor—is a man equipped on both sides of his subject. He has, in fact, as one might say, devoted his life to the teaching of binocular medical jurisprudence. A number of other men, teaching in law schools, now are similarly prepared. There should, however, be very many more of these two-eyed men. And I would add that ample time should be allowed such men in which to do their highly important work.

Finally, I wish to say that, to the student of law, all this teaching of medicine in its bearings on law—*i. e.*, the fundamentals of medicine, legal medicine, and State medicine—would be no burden, no hardship. Not only would a student, so drilled, be more fit to legislate concerning matters medical, but he would be more fit to practise law as a means of livelihood. Personal injury cases, will cases, contract

cases, inquisition of lunacy cases, criminal cases—in fact a very large proportion of all cases that ever come up in the courts, involve some medical question. Medicine is, in fact, in a certain sense, only a branch of the law. The lawyer who, in his law school days, had taken the course I have just described, would certainly be a better money-maker; and then, in addition, he would be a better lawyer and also a better legislator. Three or four hours a week for a year would be sufficient time for the work. Who can say how vastly happier the human race might not become as a prompt and natural consequence?

## A BURET FOR MEASURING STOCK SOLUTIONS, ETC.

BY

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For dispensing, making antiseptic solutions, preparing reagents, measuring urine and various other purposes, the ordinary graduates are often inaccurate and, even if carefully prepared, it is impossible to avoid a considerable error on account of their large diameter and the difficulty of delivering into or from them, by pouring. Very tall, narrow graduates are inconvenient and very liable to be broken or overturned with ensuing loss of time and often loss of valuable samples of urine, and of stock solutions that require a tedious process. On the other hand, the attempt at obtaining accurate results by using pipets or ordinary burets in the measurement of large quantities of liquid, is not only exceedingly slow but liable to gross error in tallying—the latter point having just been illustrated in checking some previous measurements by means of the apparatus to be described.

Ordinary glass tubing of an external diameter of one inch (2.5 cm.) has a lumen of almost exactly 4 sq. cm., or a capacity of about 4 cc. to the centimeter in height. (Circular area equals  $\pi R^2$ , about three and one-seventh times one-

fourth of the square of the diameter. Volume equals circular area times height.) Thus for each inch of tubing, we have a volume of about 10 cc. Allowing for placing the outlet of the tube at a convenient height, and using a footstool to sight across the upper part of the tube, 30-40 inches can conveniently be used, giving a total capacity of 300-400 cc. Since the capacity varies directly as the square of the radius or diameter, this capacity can be about doubled—theoretically increased nine-fourth times but practically not so much, on account of the necessarily thicker wall of the tube—by taking tubing of one and one-half inch external diameter. It would scarcely be practical to pass much beyond these limits since, if we increase the diameter of the tube, we diminish the accuracy of measurement considerably, while, if we diminish it, we fail to get a sufficient gain of capacity as compared with the ordinary chemical buret.

The lower end of the tube is plugged with a rubber cork, with a single perforation through which is passed a small delivery tube, over which is slipped a piece of pure gum tubing, bearing a pinch-cock. A centimeter or so above the cork—at least above the upper end of the penetrating glass tube—a zero line is marked. Above this, the tube is graduated into any convenient divisions, say 10 and 25 cc., up to the round number that comes near the top. For my own use, I graduate in 10's up to 100 and also, starting from the zero line, in 25's up to the top, making a total capacity of 325 cc. Different students will find various divisions convenient. Any arbitrary quantity frequently used, may also be marked at the side of the regular graduations, for instance 79 cc., the approximate (and sufficiently exact) quantity of strong HCl needed to make 250 cc. of the officinal dilute acid.

It is convenient to mount the buret over a washstand, so that waste water can be discharged into the basin and so that the buret can be rapidly refilled by a long rubber tube attached to the faucet. By passing the buret through a soft rubber cork of large size or a

piece of split bicycle tire, it can be fastened by an iron or wooden clamp to some convenient support.

While, as an approximate estimate of capacity, we can allow 10 cc. to the inch of inch tubing and 20 cc. of inch and half tubing, this estimate can be used only to plan our order and arrangement in the support. Even after accurately measuring one unit of capacity, we cannot safely multiply or subdivide by linear measurement, as the caliber of these tubes is not quite uniform throughout.

The graduation must be made by means of an accurate pipet or buret. Pour a little water, of the temperature ordinarily used, into the large buret, make sure that no bubbles remain in the delivery tube, and that the pinch-cock and other connections are water-tight, *i.e.*, so that the level of water in the buret does not fluctuate with manipulating the pinch-cock, and does not gradually fall, and that drops do not issue from the delivery tube, when the pinch-cock is closed. Have ready a number of slips of gummed paper about  $2 \times \frac{1}{2}$  cm. Place one at the zero line adopted. Add a unit of water from the small buret or pipet, shaking in the adherent drop and blowing out the pipet if one is used. (I prefer the small buret.) Stick on a slip of gummed paper, following in each instance the same rule, preferably that the top of the label marks the lowest level of the meniscus of water. Repeat the process until the tube is fully graduated. With a diamond or sharp-edged file, scratch a mark exactly at the top of each label, cutting the label a trifle.

The first labels may be used as more or less permanent markings, and if reasonable care is exercised not to wet the outside of the buret and the labels are marked with pencil—not with ink, which runs—they will remain in place for quite a while. Similar slips of adhesive plaster will last for months. The file marks can be rendered more visible by rubbing a pencil over them. Better yet, mark both the numbers and the file scratches with white ink expressly prepared for writing on

glass. It is convenient to number both up and down. For instance, my buret reads:

0	325
25	300
50	325
:	:
325	0

and the lower hundred is also marked upward by tens.

To illustrate the accuracy with which such an instrument can be made, with these simple tools and apparatus, mine checked off exactly with the small buret for the lower levels and between the two measurements, there was a total variation of less than 1 cc. in 325. Of course, there is an inevitable small error in delivering any single small quantity from a buret of so large lumen, but this error is not multiplied for larger quantities, except by the inevitable but very minute error in using the small buret.

The following precautions are suggested: Always read the buret in the same way, preferably by having the transverse mark tangent to the lower limit of the meniscus.

Be sure the pinch-cock (or glass faucet of the small buret) is tight.

Do not use rubber connections that are resilient enough to cause a fluctuation in the level of the meniscus on shutting off, and, if too long, they will always be so.

Always allow time enough in measuring from burets for bubbles to rise to the surface and for drainage from the wall to occur, before making a reading.

If any error occurs, start fresh.

In cutting the rubber corks, etc., use a sharp knife and wet the edge frequently. A spy sent from one rubber factory to learn the secrets of another, although disguised as a clergyman, was detected because he licked his knife before cutting a chunk of rubber.

The apparatus described can be used in marking bottles for stock solutions, and in extemporizing from catsup bottles, etc., very cheap and convenient receptacles for urine, etc. In measuring unclean material, like urine, esthetic notions can be respected by marking

with a slip of gummed paper, the lower meniscus of the height of the urine in its original container and then, after the urine is emptied, by filling the container from the measuring buret, Errors in tallying the number of times the buret is refilled and discharged, in whole or in part, may be avoided by comparing roughly with a previously marked graduate.

## SPECIAL ARTICLES.

### MOSQUITOS AND THEIR RELATION TO LEP- ROSY IN HAWAII.

BY

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Before the development of the idea of a federal laboratory on Molokai for the study of leprosy, Dr. Walter Lindley,<sup>1</sup> of Los Angeles, said, editorially, regarding the appointment of a new resident physician at the leper settlement:

"It is the intention of the new superintendent thoroughly to investigate the cause of leprosy and, in connection with this, if possible, discover what part the mosquito plays in the propagation of leprosy. The field is large and engaging, and the scientific world will watch the work of this new devotee with interest."

A few weeks previous to this the Honolulu "Advertiser" made the following editorial suggestion:

"There are few places more suitable—than the settlement of Molokai. It is a clean place under government control, where every stage, degree and class of leprosy phenomena present themselves. A whole school of medical specialists could find subjects there, and one specialist would suffer the embarrassment of riches so far as opportunities for study go. It would pay to have such a man even at his own price. Familiarity with the Oriental scourge has, in some measure, hardened our people to its presence. So long as there is segregation of the victims, the matter of a cure does not trouble them. Yet, after all, the presence of leprosy costs us \$100,000 a year in taxes, and probably keeps us from earning five times that sum from

<sup>1</sup> Southern California Practitioner, Sept., 1902.

tourists. No one can realize, unless he meets many tourists or hears Hawaii discussed abroad, how much fear there is outside of Hawaii of a malady which we insiders rarely see or bother about, and which even the Board of Health does not try to cure. One of the best business strokes Hawaii could make would be to remove that fear by abolishing the cause. It is on these grounds that we plead for a sound choice of a resident physician."<sup>1</sup>

At the time of the cholera epidemic in Honolulu, 1895, while a resident at Koloa, I published an appeal for the maintenance of the inter-island quarantine, which the authorities in Honolulu did not consider necessary, and I said in that paper in reference to the experiments of Simmond, in Hamburg, regarding infection by flies: "Suppose a fly (dipterous insect) had chanced to steal a ride from Oahu to Kauai. It might very easily escape detection." This suggestion was somewhat ridiculed at the time.

And in 1900, in a paper entitled "Mosquitos,"<sup>2</sup> I mentioned the fact that filarial disease was carried by the mosquito, stating that this common insect might well be suspected of transmitting leprosy from one person to another.

Between that time and the present, wonderful discoveries have been made, both at home and abroad, concerning the mosquito itself and its habits. The history of "life-cycles" reads like a page of fiction, and still the work goes on.

In March, at an executive meeting of the Hawaiian Board of Health, two letters were read, dated at Molokai, February 10 and 20, 1906. They were from the resident physician there, and were at once copied and made a part of official record, that "the discoveries may be fixed as to date and authority."

The president of the board, Hon. L. E.

<sup>1</sup> The present writer having, for family reasons, declined the appointment offered him April 16, 1902, the choice fell upon Dr. W. J. Goodhue out of 45 applications, and he entered upon his duties in the latter part of 1902.

<sup>2</sup> "The mosquito is a menace to the community upon which it thrives. It carries disease. It is even believed that leprosy germs are thus transmitted from a diseased victim to the healthy." Anglo-American Magazine (N. Y.), 1901, p. 35.

Pinkham, with his usual care and method then set his seal upon the following:

"To the Members of the Board of Health:

"I present to you two letters from Dr. W. J. Goodhue, relative to the results of bacteriologic investigations by himself and Father Joseph.

"These letters, one dated February 10, and one February 20, are copied.

"Concisely stated, the discovery made by Dr. Goodhue and Father Joseph is:

"1. The possibility of the existence and the proof, in fact, that *Bacillus lepræ* (Hansen) has been discovered in the female mosquito, *Culex pungens*.

"2. The discovery of *Bacillus lepræ* in *Cimex lectularius* or common bedbug."

Upon receipt of the information as to these discoveries, I advised Dr. Goodhue to avoid any publicity, for it could avail nothing at present, and would be absolutely destructive of the best interests of the Territory, in fact be disastrous by alarming tourists and others, although they would not be exposed in the slightest degree to infection.

The conditions for this phase of infection are favorable only at the settlement. I can see but one course to pursue, and that is the destruction of certain articles that are closely connected with lepers, in order to destroy the insects. I rather doubt the extensive effect of such method of transmission, for too many cases are directly traceable to family affection; still it is conceivable that cases may occur. Only increasing vigilance can effectually remove the primary mediums as disclosed above, and to that end we must devote our energies.<sup>1</sup>

"Father Joseph" is one of the resident Catholic fathers, just as Damien was, stationed for unselfish duty at the settlement. Being interested in bacteriology, he has been allowed to assist Dr. Goodhue in his laboratory, and although an amateur, he has rendered service in technical processes, and it was Dr. Goodhue's

<sup>1</sup> It was a natural caution on the part of the board to forbid publicity, particularly in the newspapers, but on May 8, 1906, Dr. Goodhue was given full permission to publish his work in any "accredited medical or scientific journal." And I think the board itself recognizes that a full understanding of the discovery will only tend to convince intelligent men of the safety that lies in a knowledge of definite transmission.

wish that, as his assistant, the name of Father Joseph be included in the record of discovery. Leaving sentiment aside, however, and speaking with absolute correctness, the discovery was made by Dr. Goodhue alone.

The following is Dr. Goodhue's letter, dated February 10, 1906:

"I wish to call your attention to a little definite progress, made by myself and Father Joseph, in respect to our unremitting microscopic and bacteriologic researches here in the Leper Settlement. During the incumbency of Dr. Cooper as president of the Board of Health, and just previous to his departure as delegate to the conference at Washington, D. C., he sent me, at my request, the Board of Health's microtome, with which we have since been sectioning mosquitos taken from various leper houses, but, until last June, without any apparent success. At that time it appeared that we had isolated bacilli in these series of experiments, but, owing to the technic employed, it was impossible positively to confirm this.

"This method was then abandoned. Mosquitos were caught at random from leper houses, being captured with a net or sterile test-tube, and the same subjected to a vapor of ether, when the mosquito became unconscious and was easily caught up with sterile forceps and placed under the dissecting microscope.

"Beginning with the anal orifice, the abdominal contents are teased out with sterile needles, thereby removing intestines, malpighian tubules, and ovaries, the female mosquito only, with one or two doubtful exceptions, feeding on blood.

"These structures are then crushed between sterile slides, stained, as usual, with carbol fuchsin, ziehl, and methylene-blue, Gabbett's, mounted in Canada balsam and examined under high-power oil immersion objectives.

"After repeated failures and the constant re-examination of fresh specimens, success has come so far as demonstrating *Bacillus lepræ* (Hansen) in the female *Culex pungens*.

"We are now making dissections of the most delicate anatomical structures of the mosquito, to determine the presence of the bacillus (an almost foregone conclusion) in the veneno-salivary glands, which will enlighten the laity as to one of the possible avenues of inoculation with leprosy, and should strengthen your hands in the determined war you are waging against this mosquito pest. In conclusion, I would state, that I have in course of preparation an article for publication in a scientific medical journal, but I hereby send you, as President

and Executive of the Territorial Board of Health, the first communication on the subject."

The second letter refers to the discovery, some weeks later, of the bacillus in the bedbug (*Cimex lectularius*), which is another story.<sup>1</sup>

The Board of Health has, through the generosity of the Legislature, provided Dr. Goodhue with an assistant physician to meet the bedside wants of the sick, giving to the resident physician more time to devote to research work.

At the same time, federal appropriation has made possible the establishment at Molokai of the United States Leprosy Investigation Station under the control of the United States Public Health and Marine-Hospital Service, in charge of Dr. Brinckerhoff,<sup>2</sup> a capable young investigator.

It will be some time, however, before any scientific work is done at this station, and, in the meantime, the resident physician at Molokai will give his spare time and best ability, aided by the means at hand, to make cultures of the bacilli in various mediums and, if possible, record the transmission of the germ from the biting parts of the mosquito and bedbug into the human body. He has also been experimenting with a serum, which he hopes may, to some degree at least, render a person immune to leprosy; but this is only in the experimental stage.

I am at present engaged upon research work in the direction of immunity;<sup>3</sup> not the study of some organic or extraneous property to induce the condition, but an investigation into the condition itself. A natural immunity exists which has been comparatively little studied. The contagion of leprosy is well established. But

<sup>1</sup> My sincere thanks are due A. A. Girault, Esq., Myrtle, Georgia, Dr. Isadore Dyer, New Orleans, Captain Patton, M.B., Calcutta, Dr. D. A. Carmichael, Buffalo, N. Y., Dr. M. J. Rosenau, Washington, D. C., Arthur Stanley, M.D., Shanghai, Dr. Ricot, Port-au Prince, Haiti, C. W. Branch, M. B., St. Vincent, Br. West Indies, and the late Dr. Wegg, of Jamaica, for exchanges, data, reports, and other personal favors.

<sup>2</sup> Studies upon Experimental Variola and Vaccinia in Quadrumana by Dr. Walter R. Brinckerhoff, formerly instructor in pathology, Harvard University. "Studies from Rockefeller Institute for Medical Research," Vol. v, 1906.

<sup>3</sup> In a small way, between "calls," as it were.

individual cases are very puzzling, so much so that capable observers in the field have doubted that the disease is spread from one to another or by any form of exposure.

How could a Hawaiian woman after living with three different leper husbands till each died of the disease in due course, yet escape infection, and die many years after, "clean?" Or the children, sisters, brothers, parents of lepers not acquire the disease, though in habitual contact with it for years!

Such histories, with unlimited variations, are amply recorded by all leprologists; they are familiar to me, and to others who have practised medicine in countries where leprosy prevails.

When the committee of the College of Physicians of London disallowed the contagion of leprosy, they still made a conditional surrender to the theory of infection, and called the unknown quantity "a hereditary tendency in the tissues." For, to them as to all students of the disease, it was known that persons of untainted ancestry, coming from a country where leprosy did not exist, into one where the disease prevails, will, upon apparently slight exposure, acquire the disease; in some cases, from a few years' residence in a leper colony, in others from the washing or dressing of garments of lepers, and, in one instance at least, from a single exposure.

How else can this be explained except by a natural immunity; the immunity which saves an unvaccinated man from smallpox after repeated and flagrant exposure to one of the most virulent of infections.

It is not the immunity of good health or a condition of general normal resistance; the resistance that overcomes *Bacillus tuberculosis*, *Bacillus typhosis*, and the various pus germs. It cannot be the mere resistance of sound tissues to the introduction of pathogenic material and the maintenance of morbid processes. Such a hematogenous antagonism we have in local lesions, and by such temporary and occasional immunity are we saved more often than we know, from pneumonia, cholera, plague and other diseases.

Why are children extremely susceptible to many diseases which an adult will hardly acquire

on full exposure? So true is this that we have books treating on children's diseases. Nature immunizes or renders susceptible, as the case may be. And the healthiest subject may get smallpox, yellow fever, or dengue, or many of the other diseases which require a prepared soil; a specific soil not necessarily due to physical deterioration, temporary or permanent.

In a rare little monograph bound in boards, and published in China several years ago, James Cantlie makes some observations and suggestions of great value to students of leprosy. He recognizes its anomalous diffusion; its so-called freaks; its innocuous simulation, but he continues to believe in its contagious nature. He is convinced of this by what he has actually seen in his large experience with leper cases, and as it is with all of us who have seen much of the disease, nothing theoretical can displace the abiding conviction. "This tendency can only mean," says Mr. Cantlie, "that the children of leper parents have a diathesis; some peculiarity in tissue development, some apparent anatomic structures of the nature of the sufferers from congenital syphilis. All that can be said of this, is, that the developmental lesion has never been noticed or made out. A very important point this would be, and worth investigating. Had the leper a birth stamp on him—persons presenting it could be guarded against, could be segregated, and there would be hope of arresting the spread of the disease. Is there a leprous diathesis, showing irregularities in anatomic structure—occurring with sufficient frequency—whereby a person of leprous diathesis can be known?" There is certainly, if not a "diathesis" (which after all is a much abused word), a dyscrasia; a constitutional and local or peripheral susceptibility to inoculation by the germ of leprosy. And this condition supplies the mediums in which the germs of leprosy will thrive; mediums we are not able to imitate by chemical means. The same condition that renders the mediums for the culture of most other germs unsuited to that of leprosy, is present in the immune subject, and this immunity may be temporary or permanent in the individual.

Cases are found in which exposure in the most adequate way has not infected the person concerned who, a few years later, falls a victim to a slight contact. It has been our error, I think, to suppose these cases to be incubatory. There is no chance of freakish happening in the natural world; and all is the result of cause and effect. What seems mysterious is only not understood, and we shall find, no doubt, that when the germ of leprosy is properly introduced in the ready soil, it will grow according to regular and specific laws. It is not according to the working of other laws of exposure to disease to suppose for a moment that *Bacillus lepræ* will remain quiescent in the tissues for 10, 20 and even 60 years, as some authors state. On the other hand, its incubation period is probably short, if the conditions are favorable.

We are led to this conclusion from the difficulty of making cultures or inoculations; the impossibility, some would say. We would infer that the germ is extremely sensitive to some condition which prevails outside of the body, and is, perhaps, found in most persons within the body. But we reach all these obscure truths in a roundabout way. We say that this acts so, and that so, drawing our inconclusive inferences. It is only a short time since we found out that yellow fever is spread by the mosquito. Before that we declared that its propagation was induced by *jomites*, yet thought some things very strange; for instance, that the disease did not spread in some directions, to some countries; that it did not travel very far. But we were very sure that old clothes and personal contact infected us, just as sure as some of us are that leprosy is not contagious, or only "mildly" so.

Mr. Jonathan Hutchinson has seen only one side of the shield when he claims that leprosy is due to fish diet, and so with one-sided theories as to spoiled rice, and so on. I am not prepared to say that even the children of lepers are disposed to leprosy, but some of them are, as are individuals who come here from Algiers or Vermont. Shall we get so far as to name a definite product in explanation of the natural perversity, precipitin, agglutinin, or coagulin;

perhaps not. Something, however, has been modified in the susceptible or dyscrasic individual, and something has brought on the modification; what it is remains to be demonstrated.

While I will indulge in no hopes not based upon actual data, and make no statements which cannot be substantiated by investigation, I can safely say that the line of work to be carried out is plainly marked already, and will be completed within a few years, if not by myself, by some of my coworkers.

Certainly the scientist in charge of the United States Leprosy Investigation Station at Molokai will have every material convenience and equipment for the successful prosecution of this work, but, as Dr. Devine said in a recent address on tuberculosis: "It is often left to the obscure with comparatively unorganized methods to point the way if not to demonstrate the great scientific discoveries."

There are not many who, like Franklin, have both abundant ideation and constructive genius; the ideas are furnished by one and the technic by the other.

*Personal Note:*—It is my intention shortly to carry on my investigations with Dr. Goodhue at the Leper Settlement and, if I can get away for a long enough period from my professional duties to accept the courtesies extended to me by various governments for work in their several leper colonies.

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## DIGEST OF LITERATURE.

### LARYNGOLOGY AND OTOLOGY: RECENT LITERATURE.

BY

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of Philadelphia.

That correct diagnosis is the physician's first aim in assuming charge of a patient, is a principle long recognized and oft repeated; in fact there is rarely a paper written, or a case reported, which does not in some way emphasize its importance. Medicine falls far short of being an exact science. The same conclusions do not always follow similar premises—hence logical deductions do not always lead to diagnoses. The fact that the same diseased conditions in different individuals is usually manifested by a common group of symptoms may throw the physician off his guard when irregular symptoms follow; and likewise the fact that certain diseased conditions differing widely in character may give rise to similar symptoms may be equally confusing. The ma-

jority of medical practitioners are conscientious in the rendering of service, striving always to be on their guard lest the unexpected should escape undetected. Thus do those who report irregularities observed—diseases without symptoms, or with unusual symptoms; differing effects from similar causes,—render quite as efficient service to their fellow-workers as do those who discover new methods for dealing with old conditions, or else add new endorsement to the old methods. A. B. Bennett, of Washington, in the *Medical Record* of April 13, 1907, reports a *symptomless mastoiditis*, followed by meningitis and death. The first evidence of disease came with grip accompanied by severe earache on both sides and almost absolute deafness. This continued for three or four weeks. The patient was at the time examined by Dr. Bennett, who found that the earache was by this time alternating from side to side, more severe at night, with almost complete deafness. The nose and nasopharynx were free from inflammation and the accessory sinuses appeared clear. The right membrano-tympanum was congested in the upper part, and along the long process of the malleus. The left membrane was congested to a greater extent and slightly bulging in its superior posterior quadrant. There was no tenderness even on deep pressure over either mastoid. The acute symptoms subsided under treatment, though leaving a sensation of fullness in the head with tinnitus, such as usually accompany chronic catarrhal processes. Some six or eight weeks after this the patient suddenly developed severe headache, vertigo, nausea, vomiting, and was sent immediately to the hospital. His temperature was 97.40; pulse 72. The drum membrane showed no change, and the mastoid area on each side was free from pain. Bennett did not deem the indications sufficient to justify operation, and kept him in bed on liquid diet for about a week, when, with another attack of nausea and vertigo, the temperature arose to 101°, showing extreme restlessness. Both mastoids were operated upon, much carious bone being found and curetted away. The dura was incised, evacuating a small amount of serum. The lateral sinus was exposed and found normal. The temperature gradually arose, reaching 104° by the following morning and 105° by the afternoon. The patient died in the evening, with temperature still 105°. Postmortem examination revealed the longitudinal sinus greatly engorged, as were also the vessels of the dura mater. The removal of the dura exposed a

diffuse lepto-meningitis. The removal of the brain and cutting of the spinal cord was attended by the outflow of blood and pus in large quantities, the brain being literally bathed in pus. In the left lateral sinus was found a large, soft, dark clot; in the torcular herophili, a similar clot; and in the right lateral sinus, a thrombosis. It cannot be possible that this amount of disease came on suddenly, and just when and how the infection took place is unknown. Bennett states that it is appalling to think that for two months he saw the patient every few days, and that the apparently good results so completely deceived him as to the actual condition. During the entire attack, the patient had no fever to his knowledge until four hours before the operation; at no time was there any mastoid tenderness; the membrano-tympani never perforated or discharged; the conditions steadily improved, and the symptoms of meningitis were the first symptoms that pointed toward an indication for operative interference.

*Intranasal Conditions as Bearing upon the Etiology of Diseases of the Ear.*—

G. Hudson Makuen (*Medical Record*, February 16, 1907) makes the following statements: That diseases of the ear, especially in their initial stages, are largely dependent upon intranasal conditions, is a fact well known to otologists, but it is not generally recognized by practitioners of medicine. In this connection the following points in the anatomic and physiologic relationship of the ear and nasopharynx cannot be too often or too strongly emphasized. The tubo-tympanum is a culdesac or sinus, occupying exactly the same relation to the nasal cavity that the sphenoid, ethmoid, maxillary and frontal sinuses occupy, and the lining membrane of the tubo-tympanum is merely a continuation of that which lines the nasal and accessory cavities. Moreover, the physiologic relationship of the middle ear to the nasal cavity is also similar to that of the pharynx, and it is aerated by means of nasopharyngeal respiration. There is a slight excursion of the drum membrane during each respiration, the motion being inward during inspiration and outward during expiration. The conditions in the nasal cavities giving rise to acute diseases of the ear are, first, those causing disturbances of nasal respiration; second, those attended by suppurative intranasal and sinus inflammation; and third, any condition which by pressure or otherwise may give rise to reflex disturbances. The first class includes hypertrophic and atrophic rhinitis, intranasal growths, septal deflections

and spurs, and nasopharyngeal hypertrophies and tumors, and the damage to the ear is chiefly mechanical in its origin. The second class includes all catarrhal conditions of the nasal and accessory cavities, and the damage to the ear is usually by continuity of structure. The third class includes those conditions which give rise to irritation of the terminal nerves in the nasal and accessory cavities and set up ear complications by so-called reflex action. Severe pain in the ear may also be the result of pathologic conditions in the nasal and accessory cavities. Many illustrations of this fact might be given. At the recent meeting of The British Medical Society, in Toronto, Dr. St. Clair Thomson said, that in several of many cases reported of aural pain due to sphenoidal disease, the mastoid was suspected and even opened before the real cause of the trouble was determined.

[Another point in this connection, which should always be kept in view when the cause of pain in or around the ear seems obscure, is a careful examination of the teeth, from which irritations are not infrequently referred to the middle ear, and even to the mastoid process. A case which recently came under my own observation was that of a child, nine years of age, who had suffered at frequent intervals for nine months with pain centered about the ear, over the mastoid and along the neck in the submastoid region. She had been treated both locally and internally, careful attention being given to the ear, nose, and nasopharynx, with only temporary relief at times; until finally a small cavity in the posterior part of an upper bicuspid was discovered, which being treated by the dentist the pain ceased, and has not since recurred, it being now about four months since the cavity in the tooth was filled. The pain had not at any time been felt about the teeth. J. L. D.]

*Relation of Tonsillitis to Rheumatism.*—E. Fletcher Ingals (Illinois Medical Journal, June, 1907) gives the following conclusions on this subject: 1. The relation of tonsillitis and rheumatism is not casual, but due to an identical cause for the two in from 13 percent to possibly 29 percent of all cases of acute tonsillitis. 2. Of the cases of tonsillitis 45 percent have a rheumatic history, but 16 percent of other affections of the throat and chest also have a rheumatic history, so that not more than 29 percent of the cases of acute tonsillitis can fairly be attributed to the rheumatic poison, and more than half of these are very doubtful. 3. Only 19 percent of his cases gave a history

of previous attacks of articular rheumatism, and 18 percent a history of muscular pains that they ascribed to rheumatism. 4. Of the cases of acute tonsillitis 8 percent were attended by or immediately followed by articular rheumatism. 5. There is not as yet sufficient evidence to prove that the tonsil is the only or even the chief portal of entrance for the rheumatic poison; considering, however, that in all probability acute articular rheumatism represents a mild type of septic hematogenous infection of the joints, there is no reason why the tonsil, with its notorious facility for the infection with pyogenic germs, should not possibly even frequently assume the role of an infected wound, leading to septic consequences of a systemic nature. 6. The evidence does not yet justify the belief that inflammation of the tonsil may prevent (or take the place of) an attack of rheumatism. 7. The statement that the acute beginning of muscular rheumatism is nearly always preceded by tonsillitis is not supported by the history of his cases, in only 2 percent of which did muscular rheumatism follow tonsillitis. However, in 6 percent, muscular pains that were called rheumatism attended the tonsillitis, though they may have been due to the fever attending the inflammation of the tonsils.

*The Etiology of Nasal Polypus.*—J. S. Fraser, M.B., F.R.C.S., of Edinburgh (Scottish Medical Journal, April, 1907), gives an exhaustive study on the etiology of nasal polypus. He gathers from other authors the following theories, which have hitherto been advanced: 1. Nasal polypi are true tumors. 2. They are modified granulations. 3. They are due to accessory sinus suppuration. 4. They are the result of underlying bone disease. 5. They are due to blockage and dilation of the glands in the inflamed submucous layer. 6. They are the results of chronic inflammatory changes in the nasal mucous membrane, etc.

The last five of these theories agree that an inflammatory condition is present, and it is the object of this paper to show that we can go so far with certainty, but we cannot find accessory sinus suppuration or bone disease or dilation of the mucous glands to be present in every case; we can, however, in all cases find evidence of the presence of one or more of the signs of chronic inflammation, e.g., catarrhal changes in the mucous membrane, small cell infiltration, dilation of vessels, edema, thickening of vessel walls, proliferative changes in the periosteum, infiltration of the marrow spaces by inflammatory products, and changes

in the bone usually of the nature of hyperplastic osteitis, more rarely rarefying osteitis. In the milder and more recent cases the changes do not as a rule reach more deeply than the glandular layer of the submucosa, but in the more severe and chronic cases there are evidences of plastic periostitis and osteomyelitis. He reports 30 cases seen with Dr. Logan Turner, and ends the article with the following conclusions: 1. In many cases of acute and chronic nasal catarrh the mucous membrane of the middle meatal region becomes infiltrated with inflammatory exudation (serum), which gives the part an edematous appearance. 2. At first only the superficial layers are involved, and the great majority of cases end in a return to normal conditions. 3. In a few instances, however, the inflammatory edema continues and spreads more deeply, resulting in a more or less extensive swelling of the tissues and visible as chronic edema of the anterior end of the middle turbinal, ethmoidal bulla, or uncinat process. 4. This edema is increased by the action of gravity, and in chronic cases probably by venous and lymphatic obstruction. The result is the production of definite polypoid swellings or nasal polyps, which are therefore merely edematous hypertrophies of the mucous membrane. 5. Suppuration in the nasal accessory sinuses, bone disease, and glandular dilation or cyst-formation are all frequently present. Many cases of sinus suppuration exist in which no polyps are present in the nose, and the reverse is also true. Bone disease is not present in early cases, and is not the primary cause of nasal polyp formation. Edema of the submucous tissue is present before glandular changes begin, and continues after the glands have disappeared. 6. In all cases there is evidence of a chronic inflammatory condition, and in those of long standing thickening of the periosteum and vessel walls may be observed, together with proliferative changes in the marrow spaces. Rarefying osteitis is less frequent than hyperplastic osteitis. 7. If the mucous membrane alone is involved it is sufficient to remove the edematous hypertrophy, but if the bone is affected the diseased part of the ethmoid must be removed. Microscopic examination of a small piece of bone may give valuable information as to prognosis and treatment.

**Typhoid fever** is reported to have crippled the staff of the Johns Hopkins Hospital, three of the internes being seriously ill with the disease.

## DERMATOLOGY: RECENT WORK.

BY

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of Philadelphia.

*Radiotherapy in Dermatology.*—The röntgen ray, although an efficacious form of treatment in various diseases, is not the harmless remedy as was first thought. The rays should be used exclusively by those who are familiar with the indications for their use and who know the proper therapeutic application. Almost a year ago Dr. Andrew P. Biddle (Amer. Quart. Röntgenology, 1907, p. 11) was asked by the Executive Committee of the American Röntgen Ray Society to collect the views of dermatologists and radiotherapists, on the use of the rays in acne, acne rosacea, eczema, and psoriasis, and to report the conclusions to the society. Naturally conclusions were somewhat difficult to determine, as more than 50 physicians, both in this country and abroad, responded to the circular letter issued. In acne the consensus of opinion seems to be that ray therapy should be applied only to the very stubborn and deepseated type of cases, particularly those which have not responded to other forms of treatment. The exposure should be short and the cathode some distance from the patient. The response to this form of treatment seems to be more rapid in those with pale and oily skins. The rays apparently are no more rapid in results than other forms of treatment, but the tendency to recurrences is reduced. The results in acne rosacea have not been very satisfactory. The dilated bloodvessels and enlarged nose have not been noticeably altered by this method of treatment. In the few cases in which the rays have been curative, the glandular element has predominated, and the result has been more rapid than from other forms of treatment. This therapy cannot be given with too great caution in this condition. The use of the rays in eczema has very marked limitations. This treatment should not be tried in acute eczema, excepting where the pruritus is very marked and unusually prolonged. Used carefully in selected cases of subacute type it has been of benefit. It should never be used in childhood excepting in the most persistent of cases. The chronic, thickened areas of eczema, usually found on the hands and the feet, frequently respond rapidly to this form of treatment. Relapses are as frequent as with other therapeutic measures. Röntgen therapy in psoriasis, excepting in the few cases in which

the lesions are large, few, and very localized, has not been particularly successful. In most cases even with a few large infiltrated patches, the exposures have to be numerous, and after the disappearance of the lesions the relapses are frequent. The response to this remedy in psoriasis of the nail has been more satisfactory than of the general surface. These deductions are of great value, notwithstanding the different technic that has been used by these various observers from so many different countries.

*Segregation of Lepers.*—Whatever can be accomplished toward improving and making happier those unfortunates afflicted with leprosy should have the entire approval of everyone. Dr. Heiser (Med. Record, June 8, 1907) describes in detail the segregation method now employed in the Philippine Islands. Leprosy had been increasing in these islands until this isolation method was tried. During the few years of American occupation in which this method has been in vogue, the number of leprosy cases has noticeably decreased. Unfortunately sufficient funds are unavailable to segregate and support all the lepers. The largest colony is on Culion Island and quarters are provided for 800 individuals. This colony is practically self-governing, with the presiding officer and all the officials under him being lepers. The town of Culion is sanitary in every way, with drainage and sewerage systems and all modern conveniences. The streets are wide and the houses well constructed. Only those cases in which *Bacillus lepra* has been microscopically demonstrated are isolated on this island. The röntgen ray has been used with success in some of these cases.

*Opsonotherapy in Acne.*—Since the Wright opsonic method has been in vogue a few selected cases of acne, sycosis vulgaris, and other pustular conditions have been successfully treated. As yet but few dermatologic conditions have been treated, and the number of cases experimented on by this injection method has been too few to analyze the results. An extremely interesting article has appeared recently by Ochsner and Abelman (Illinois Med. Journ., June, 1907) describing a case of acne varioliformis, probably acne vulgaris, treated by the vaccination method of Wright. Ochsner first describes a typical case of acne vulgaris of the face, of an unusually severe type, in which deep-seated pustules and large subcutaneous abscesses predominate. Abelman gives in detail the isolation of the

bacillus described by Unna, *Staphylococcus pyogenes aureus*, and the preparation of various serums. The blood taken from a patient suffering with a severe pustular condition is capable of destroying less organisms than that taken from an individual in normal health. Therefore the opsonic index is found lowered. The opsonic content can be raised by injecting vaccine prepared from the specific organism causing this condition. This is the theory upon which the opsonotherapy is based. It is extremely difficult to gauge the proper dosage, and the interval that should elapse before repeating the injection. In the event of an overdose the index is decreased, the leukocytes are increased, and the condition is made worse. If a correct dose is given the opsonic index is increased nearer the normal, the leukocytes are decreased, and the disease is helped. If the injection is too small the conditions remain the same. This bacillus of Unna is extremely difficult to obtain in pure culture. In this case it was found, without being contaminated, only in the deep-seated lesions. The bacillus is 2-5 microns in length and .5 of a micron in width, it is motile, flagellated, and has very resistant spores. It is pathogenic to mice and guinea pigs. Three different vaccines were used, two were prepared from dead staphylococci, and the third from the bacilli of Unna. From 200,000,000 to 900,000,000 organisms were injected at various times. Overdosage was unfortunately given on several occasions, but as the index was carefully watched no damage resulted. The photographs of the patient show the remarkable result obtained by the four months of opsonic treatment. As the opsonic index is approaching the normal in this case a permanent cure is more probable.

*Röntgen-ray Treatment of Ringworm.*—A little over three years ago Sabouraud (Ann. de l'Institut Pasteur, Jan., 1904) originated the idea of treating his cases of tinea tonsurans with the röntgen rays. Since then various papers, including his own, have been written testifying to the efficacy of this method. One of the more recent papers on this subject has been presented by Dr. Agnes F. Savill (Archives of the Röntgen Ray, May, 1907). Thirty-six cases were treated by the ray, using the barium platinocyanid pastil of Sabouraud and Noiré as the indicator. It is a noticeable fact that the length of the exposures varied considerably, between seven and 70 minutes, before the proper tint was produced in the pastil, thus suggesting that

the changes in the current and tube were not sufficient to explain this marked difference in the time of exposure required. The anti-cathode was invariably placed 16 centimeters from the head and the pastil was exactly half-way between these points. The spark-gap was usually placed at 11 centimeters. The amperage and voltage used depended upon the newness of the tube, from .5 to 5 amperes, and from 40 to 90 volts. In the first cases treated numerous exposures were required before the entire scalp was depilated, one exposure to each area. Very small areas were rayed at each sitting. In the later cases the entire scalp was rayed in from four to six exposures. The area treated should be carefully outlined with ink or some stain, and the other portions of the scalp well protected, so that the same area may not be rayed a second time, excepting at a long interval; otherwise permanent baldness might result. Hair fall usually occurs from 10 to 21 days after exposure to this method. Soft down, in the majority of the cases, appears on the scalp three months after this depilatory treatment. Only the scalp hairs affected by the fungus need be depilated. Antiseptic treatment should be carried on in the interim. Recurrences after this method, if properly administered, are unusual.

*Pityriasis Rosea Diagnosed as Syphilis.*—A physician cannot be too careful in arriving at his diagnosis. As the paper of Dr. Wise (Med. Record, May, 1907) points out, numerous physicians, in the event of a cutaneous eruption which is unfamiliar to them, or resembles lues in any way, immediately place the patient on antisiphilitic treatment. No greater injustice could be done to anyone, than to have that constantly recurring fear that any eruption on the skin, no matter how slight, is a relapse of the old syphilis (which they in fact may have never had). Four cases of pityriasis rosea are described in this article, in all of which the diagnosis of syphilis had been made by physicians other than the writer. In three of these cases specific treatment had been given, in two of the same to marked pyralization. The typical lesion of pityriasis maculata and circinata is a dime sized, superficial, pinkish, circinate lesion, with a fawn colored, crinkled, and slightly scaly center. The disease is almost invariably limited to the chest, abdomen, back, and shoulders; sometimes involving the upper portion of the arms and the legs. The face and the hands are rarely involved, and the

lower legs and forearms are also usually unaffected. Slight itching may be present. Glandular enlargement and a mild pharyngitis may precede or accompany the attack. The disease usually runs its course in three to four weeks, disappearing spontaneously. An initial spot, morphologically the same as the later lesions, appears on the trunk, ten days to two weeks before the more general eruption. If the initial lesion of syphilis can be found, and if the eruption is typically generalized, including the hands, palms, feet, and face, with mucous patches, and all the concomitant symptoms, no difficulty should arise in the diagnosis. Pityriasis rosea could only be mistaken for an atypical form of syphilis. The individual lesion in this disease is so characteristic that if examined carefully the diagnosis should be clear. An important point is brought out in this paper, that the history given by the patient is frequently unreliable.

## RECENT EDITORIAL OPINIONS.

**The Journal of the American Medical Association.**—ASEPTIC SUPPURATION IN RELATION TO ACUTE PLEURITIC EFFUSIONS: Opie has called attention to an enzyme in the finely granular leukocytes (*leucoprotease*) which is held in check under ordinary conditions by an inhibitive substance in the blood-serum. So that depending on the predominance of either leukocytes or serum in a localized area we have suppuration with solution of leukocytes, fibrin, etc., or the accumulation of leukocytes without suppuration. These ideas suggest the possibility that removal of the serous fluid from the chest cavity during the acute stage of a pleuritis may convert a simple serofibrinous into a purulent exudate. Or that empyema following aseptic aspiration of the pleural cavity may be due to the removal of the inhibiting serum rather than to contamination.—THE CEREBROSPINAL FLUID IN PARESIS: Considerable work has been done on the cerebrospinal fluid since 1901 and especially by the neurologist and the psychiatrist. Of the three methods of examination—the cyto-count, the estimation of the pressure of the fluid, and a determination of the proteid content—the first is probably the most important. The technic in vogue in the past involving a centrifugation of the fluid gives results which are unsatisfactory in individual cases and also for comparison. The more recent method of using the pipet

of a blood counter, mixing the undiluted fluid with a staining reagent and counting in a Türk chamber gives much more satisfactory results. According to Cornell the value of such an examination of the spinal fluid in general paresis depends on the fact that there is an early increase in the small lymphocytes in the fluid in this disease and not in the conditions which simulate it.—**ANTIDIPHThERIC SERUM AND POSTDIPHThERIC PARALYSIS:** Rosenau and Anderson have produced in guineapigs paralysis identical with that seen in human beings by a partially neutralized mixture of diphtheria toxin and antidiphtheric serum so adjusted as to leave the toxon or paralysis producing constituent of diphtheria toxin free to exert its specific action on the nervous system. It was shown that antitoxin cannot influence the paralysis after it once appeared or prevent it if given immediately before its time of development. But given earlier, small doses are effective in either preventing it altogether or greatly modifying its severity. Even more favorable results in the prevention of paralysis may be expected in man by early administration.—**FEW APPLICATIONS FOR THE MEDICAL CORPS OF THE ARMY:** At the examinations held July 29 to fill vacancies existing in the medical department of the army there were only 26 applicants. Of these, 12 withdrew and of the remaining 14 only three were successfully passed. These with the seven who passed in April make only 10 men to enter the Army Medical School in October. The number of vacancies occurring each year is greater than can be filled from the list of candidates. Legislation is needed increasing the inducements to young medical men to enter the army medical service.—**NEWSPAPER PRESCRIBING:** In the *Philadelphia Record* there have been published prescriptions in answer to letters describing various diseased conditions in which exceedingly potent drugs are advised. If the author of these prescriptions is a layman it would seem that he is guilty of an infraction of the medical law; if he is a licensed practitioner he is guilty of unprofessional conduct in a grave degree to say nothing of indulging in a most vicious form of contract practice. This surely calls for a protest from the readers of this Philadelphia paper.—**GUSTATORY AUDITION:** Pierce has recently reported the case of a young woman who experienced gustatory sensations on hearing sounds such as spoken words or certain nonvocal sounds. The observations included oral perception of temperature, texture, and consis-

tency as well as true gustatory perception, but did not include olfactory qualities as she was anosmic. The explanation for this phenomenon has not as yet been made though the possibility that it depends on a cross circuiting of the association fibers between different brain centers is to be considered.—**MEDICAL COLLEGES AND STATE PRACTICE ACTS:** There seems to be a steady advancement in the standards of medical education in the United States. This is especially borne out by the fact that many of the medical colleges throughout the country, beginning with the session of 1910 or earlier, will require for admission one or more years' work in a college of liberal arts. Some of the State examination boards are supporting this movement by making the same requirements of prospective practitioners in their respective States. On the other hand new medical schools are being organized solely for profit or based on one of the now more or less popular fads. Graduates of these schools with their lower requirements and lower standards should be required to undergo the same test as the graduates of regular high classed schools as to their ability and their knowledge of medical science. The examining boards should have supervision over all medical colleges within their respective States with authority to pass on their entrance requirements and should have the right to inspect and close such colleges as are not properly equipped or are not doing satisfactory work.—**PREDISPOSITION OR IMMUNITY IN THE CHILDREN OF THE TUBERCULOUS:** The theory that individuals suffering with tuberculosis transmit to their offspring a predisposition to the disease is so firmly established that the proposition put forth by recent observers that these individuals at the same time transmit a partial immunity seems rather paradoxical. So many factors must be considered in deciding the truth of this question that it is difficult to present evidence which is at all conclusive. More or less confusion is caused by the difference in methods of presenting statistics and by the fact that most of these statistics have been taken from reports dealing with adults or at least excluding the very young. To draw a fair comparison it would be necessary to contrast the course of the disease in all the tuberculous children of a certain number of tuberculous parents with the course of the disease in patients whose parents were not tuberculous.—**NATIONAL SANITARY DEPARTMENT IN CUBA:** Governor Magoon has recently published a decree establishing the national sanitary department in Cuba. This

action has been brought about by the inability of the municipal governments to provide sufficient funds for the support of an efficient sanitary service. With a proper organization and sufficient funds a great improvement in the sanitary conditions in Cuba is to be expected with a disappearance of yellow fever as took place under the former American administration.—THE "CONSCIENTIOUS OBJECTOR" TO VACCINATION: A special clause in the regulations regarding vaccination allows those individuals who have "conscientious objections" to vaccination to dispense with this most essential prophylactic measure both for themselves and their children. Careful investigation of a recent outbreak of small-pox in Vienna revealed the fact that there are three times as many unvaccinated children at present in that city as in any previous year of recent times. These children are for the most part the offsprings of the poor and ignorant who make up the greater number of "conscientious objectors" to vaccination and are also the ones who are suffering from the present epidemic. It would seem, therefore, that the helpless offspring should at least be protected from the results of parental folly and ignorance.—THE PLAGUE IN SAN FRANCISCO: The recrudescence of the plague in San Francisco is a matter of more than local importance and while there may not be great danger of spread to other parts any neglect of precautions would be culpable. Although handicapped by the disgraceful conditions reported in the City and County Hospital and by the apathy and inefficiency of the local Board of Health the city now has a mayor who can be expected to appreciate its needs properly. The County Medical Society is also fully awake to the situation and is taking active steps to aid in the enforcement of recognized principles in plague control.—THE DISPENSARY PROBLEM: This problem has been under discussion for some time and measures pointing to the solution of some of its difficulties have been enacted which have met with more or less success. Dr. Goldwater, of New York, has recently made some very pertinent suggestions along this line. He proposes the limitation of the number of patients which the dispensary is allowed to treat, basing the limitation on the facilities which the dispensary possesses. He also suggests that the area from which patients come who attend a given dispensary shall be limited to a certain district. In association with this latter suggestion an extension is urged of the system of following certain patients

to their homes in order to control, to a certain extent, the hygienic conditions under which they live. If these suggestions were followed out the task of protecting the dispensaries from imposition by individuals who can afford to pay a physician would be much simplified. It is quite evident that progress in the solution of this problem must proceed along the lines indicated by these suggestions.—CACTUS GRANDIFLORUS: There is so much obscurity about this unofficial drug that Dr. Hatcher's summary recently published of the literature of the chemical and experimental phases of the subject is interesting and instructive. He practically concludes that the active principle of *Cactus grandiflorus* has never been isolated and that, therefore, the claims that commercial products contain the pure isolated, active, principle cannot be strictly true. Good evidence is presented in support of these conclusions. And from them it may be doubted whether an active principle of the plant really does exist. So that to rely on cactus in the treatment of cardiac diseases is to depend on nothing more substantial than air.—CONCERTED ACTION IN TUBERCULOSIS CONTROL: Centers of tuberculous population have become so numerous in recent years in this country that special sanitary precautions are necessary in them. The rules and regulations recently adopted by the Saranac Lake Society for the Control of Tuberculosis represent the form of control of this disease which is likely to be of benefit wherever there is a noteworthy amount of the disease. The objects of the society are declared to be the enforcement of sanitary laws, the education of the general public, dispensary treatment for needy patients and the general dissemination of reliable information about Saranac Lake and its vicinity. The most important field for education is among those who as boarding house keepers come in intimate contact with tuberculosis. Much good will follow this instruction if it is properly sanctioned by law, so that it is proposed to require the reporting and registering of all cases, and the enforcement of sanitary rules. This scheme represents a movement in the crusade against tuberculosis which should be taken up by every community which like Saranac Lake must assume the burden of more than its normal quota of the tuberculous though every small town in the United States might well follow the example thus set.—A POSTGRADUATE COURSE FOR COUNTY SOCIETIES: This journal has just published an outline of the first month's work of a course of postgraduate

study for county societies which may serve as a suggestion and a starting point for those societies which are in a position to take up systematic postgraduate study. From this as a beginning it is hoped that there may be evolved a systematic practical course of study which may later on be supplemented by personal instructions from competent teachers as well as by laboratory demonstrations and instructions in practical methods.—**SCIENTIFIC SUPERVISION OF COMMERCIAL CLAIMS:** Some time ago there was introduced in Germany under the name of "Atoxyl" a new organic compound of arsenic which has now come into special notice through its semiendorsements by the Liverpool School of Tropical Medicine and by Koch in Africa on account of the alleged favorable results from its use in trypanosomiasis. The prominence thus conferred on the preparation led to the investigation of its composition by scientific men in France, Germany and in the United States. The results of these investigations would seem to require a modification of the former extravagant statements concerning the preparation made by American agents. Such scientific investigations of the claims of manufacturers of medicinal preparations is to be urged in the future.—**THE ROYAL COMMISSION ON NOSTRUMS:** Some years ago a royal commission was appointed to investigate the causes of the steady decline in the birth-rate in New South Wales. The conclusion at that time was that one of the causes for this condition was the use of noxious "patent medicines" and recommendation was then made that a separate commission be appointed to pursue this line of investigation. The report of this latter commission just published is a compilation that collects and lays bare officially all that has been done in this direction and adds much important material gathered by the commissioner in the course of his study. The fundamental principles established as essential to a remedying of the conditions as laid down by the commissioner are, (1) prohibition of secrecy, (2) punishment of deception, and (3) responsibility both of the publisher and of the vendor. The perusal of the report brings out two main facts: First, the significance of such an investigation by a government regardless of the antagonisms which must be aroused among those whose "vested interests" are thus threatened, and, second, a sense of humiliation to find that "many or most of these swindlers, together with the traffic in private letters of patients, are American." This evil should receive that

attention from the public press that the exposures and denunciations of the medical profession have hitherto failed to secure for it.—**OPHTHALMOTOXIC REACTIONS:** A distinct advance in the method of diagnosis recently proposed by von Pirquet of eliciting a cutaneous reaction in tuberculosis by the subcutaneous injection of the corresponding toxin has just been made by Calmette, who showed that if tuberculin were instilled into the eye there would be a marked congestive reaction in the case of tuberculous patients, while the healthy or nontuberculous responded with a very much milder reaction. Chantemesse, working along the same line, recently reported that he had successfully applied the same method to typhoid fever and that the reaction thus obtained was a very reliable and early sign. The test is accompanied with very little discomfort and if further investigations uphold its reliability it should prove a valuable sign.—**IRON AS A THERAPEUTIC AGENT:** Clinicians and physiologists have always been at variance in their explanations for the good effects of the administration of iron in chlorotic conditions, the latter having us believe that the conversion of the simple molecule of iron in the intestine into the complex molecule of hemoglobin in the blood is impossible. Erich Meyer has recently critically reviewed the literature on this subject and from the evidence presented concludes beyond reasonable doubt that inorganic iron can be and is absorbed from the intestine and utilized in the formation of hemoglobin when given in the usual medicinal doses. It is probable that no matter how the iron is combined when it enters the stomach it is first converted into ferratin and stored up in the liver; this constitutes as intermediate step in the conversion of food iron into hemoglobin. Further studies indicate also that direct absorption of iron occurs through the walls of the gastrointestinal tract and that the paths of absorption seem to be much the same whether the iron is taken as complex organic or as simple inorganic compounds. The greater part is absorbed in the duodenum although it may be absorbed lower down in the small intestine and probably enters the blood rather than the lymph. From all of this it would seem that there should be no fundamental difference whether the iron given therapeutically is in organic or inorganic form and this may be the real reason why there exists so much honest difference among clinicians as to their choice of iron preparations.—**THE ERROR OF THE VEGETABLE UNIT DESCRIPTION:** A

common error of medical writers is that of describing the size and shape of a pathologic growth or area of tissues by comparing it with some common object, a method which is a constant source of annoyance and difficulty to those who would later make use of the descriptions. The chief reason why this method is defective is that objects especially among vegetables have different sizes in different countries. A better method would be to use some definite system of weights and measures in such descriptions which would be more or less intelligible in different countries.

**The Boston Medical and Surgical Journal.**—**PLAGUE IN INDIA:** The plague situation in India is of far-reaching interest and importance. Renewed interest has of late been aroused on account of the deep interest of the King of England in the adoption of measures to combat the disease successfully. The measures of relief are as yet not definitely determined but probably the most important of them will consist in the organization of four or five administrative centers in places where plague is endemic. In these centers will be stationed a well-equipped medical department with all the methods at present known of combating the disease through fumigation, disinfection, destruction of rats and other vermin and means for carrying out a careful pathological and bacteriological study of the disease. The death from plague in India during the past 11 years has been estimated at upward of five and a half millions. Haffkine's discovery of a method of plague inoculation in 1897 was appreciated by the Indian government but through an unfortunate misunderstanding his continued service has been hampered. As a result of investigations undertaken by the Lister Institute in 1905 it has been fairly definitely proved that the disease is transmitted by rats through the direct medium of the rat flea. So with this start it is hoped that the renewed activity will either eradicate or markedly diminish the prevalence of a disease, the continued existence of which is rapidly becoming a reproach to modern medical science.—**THE ALARMIST PHYSICIAN:** The alarmist with his pessimistic views on all conditions of illness fortunately is becoming rarer. This attitude of mind, however, is even yet far too prevalent and often leads to condemning patients to lives of invalidism or premature death on grounds which if carefully considered would permit of no such gloomy outlook. With the changes in the conception of disease conditions and in methods of treat-

ment we have come to the conclusion that in any individual case we really know very little about its prognosis. This is forcibly illustrated in the case of tuberculosis. The same is true in lesser degree of many other diseases, the prognoses of which have absolutely changed in the life time of many physicians now living. Even if we think we are sure of our prognosis it is manifestly unwise in a great majority of cases to express that opinion to our patients. In some cases, however, a tactful telling of the exact truth seems to be best for all concerned.—**POLIO MYELITIS IN NEW YORK:** In view of the prevalence of this disease in New York City a systematic campaign against the disease has been undertaken. Circulars are to be sent out to physicians in the city and the nearby towns with the request for such reports as would help to establishing the usual surroundings in which the disease occurs most frequently and thus afford some idea of the conditions favorable to the development and growth of the supposed morbid organisms. A great handicap in the way of successful treatment is that the cases are not brought to the hospital in the acute stage.—**BLINDNESS FROM BIRTH:** At the recent meeting in Boston of the American Association of Workers for the Blind the statement was brought out that nearly 70 percent of the existing cases of blindness might have been prevented, since the blindness was due to an ophthalmia at birth which naturally is avoidable in the great majority of cases. In Prussia a law provides for the reporting of every case of ophthalmia or conjunctivitis during the first two weeks of life, just the same as other contagious diseases. If such a law could be enforced, much suffering for the individuals and much expense to the State could be avoided by the proper treating of these cases.—**PHYSICAL CONDITION OF PUBLIC SCHOOL CHILDREN.** A body of prominent educators made up of the Commission on Physical Welfare of School Children has just made a report in which it is stated that about one-third of all the public school children in the United States are probably the subjects of physical defects which keep them behind their proper grades and yet which should be remediable with proper care. Comprehensive plans for dealing with physical defects outlined in the report include a thorough physical examination of all children, notification to parents, the enforcement of existing health, tenement house and child labor laws and the establishment, in connection with boards of education, of departments of school hygiene. It is also suggested that the school curriculum should

be so devised and carried out as not to favor such defects and that hygiene should be so taught that the children will cultivate proper habits of health. Superintendent Maxwell in a recent address to the principals of the public schools of New York stated that special attention should be given to four classes of pupils. To overaged children to determine whether their retarded intellectual development was due to physical defects; to children who were evidently suffering from physical defects; to incorrigible children with a tendency to idleness and mischievousness; and to the persistent truant.—

**DEATH OF DR. JAMES CARROLL:** The death of this man should not be allowed to pass without some notice of his career. Although Dr. Carroll recovered from a severe attack of yellow fever contracted in order to demonstrate the truth or falsity of the theory of mosquito transmission of the disease, his death could be traced quite clearly to an affection of the heart resulting from the yellow fever. Born in Noolwich, England, June 5, 1854, he enlisted in the United States army in 1874 serving in turn as private, corporal, sergeant, and hospital steward, employing his time during the latter part of this service in the study of medicine. In 1891 he was graduated from the Medical Department of the University of Maryland and then studied for a time in the Johns Hopkins Hospital. In 1897 he served with Reed, Lazear and Agramonte on a commission to investigate yellow fever in the United States, during which investigations he permitted the experiment on himself which later led to his death. In 1899 he received a commission in the Medical Department of the army and in 1907 the commission of Major and Surgeon. His chief claim to perpetuity will be in the spirit of self-sacrifice which led him to accept a very real danger in the hope that a unique and far-reaching doctrine might be substantiated.—**IMPROVED HEALTH OF SCHOOL AND COLLEGE STUDENTS:** Contrasting sharply with the diseases incident to school life and the generally injurious effect of grade and high school conditions of the present day, is the statement that the scholars who graduate from our high schools today are taller, heavier and stronger for the same age than they were a generation ago. This has been proved by Dr. P. C. Phillips from statistics of students of Amherst College, by Mr. J. B. Vines from records of the schools in England and from examinations carried on at Smith College, Wellesley, Oberlin, Chicago and Mt. Holyoke Colleges.—**COCAIN AND THE NEGRO:** As a partial explanation for the commission of the wanton

murders and deadly assaults by negroes without any regard to consequences and with indifference to the suffering of themselves or their victims the use of cocain has been suggested. In industrial settlements where the negro is largely employed enormous quantities of this drug are sold and contractors claim that they could not keep their forces together if the men were unable to secure cocain in the immediate vicinity.

**Medical Record.**—**THE ARMY CANTEEN:** The question of the restoration of the army canteen has again come up for discussion. While army officials are as a rule in favor of its re-establishment, Congress, under the influence largely of temperance women, seems to be opposed to the idea. Total abstinence cannot be enforced among soldiers on the same ground that it is among railroad employes, largely on account of the difference in the remunerations in the two employments and the great difficulty that exists in securing men for the army, for they look on this limitation as a loss of one of their rights. Experience has shown also that conditions were considerably more satisfactory among the soldiers with the canteen than without it.—**INDIGO-CARMINE IN THE DIAGNOSIS OF THE KIDNEY FUNCTION:** Suter, in a recent investigation, showed that indigo-carmin injected subcutaneously into the muscles is excreted by the normal kidney in 10 to 12 minutes and could be detected in the urine by its blue color. This test may be utilized to determine the presence of a diseased kidney for the blue color does not appear in the urine from the latter. Minor grades of functional disturbance may be suspected when the color is of a lighter blue. In Suter's 37 cases, 35 nephrectomies and two nephrotomies were performed with no deaths from insufficiency of the remaining kidney, a sure proof of the reliability of this test.—**VARIOCOCELE AS A SYMPTOM OF MALIGNANT KIDNEY TUMORS:** Hochenegg has called attention to variocoele as a symptom of malignant tumors of the kidney previously described by Guyon, Isreal, Schede, and Küster. The main point of difference between this symptomatic variocoele and the idiopathic form is that the latter disappears when the patient assumes the dorsal position. This difference depends on the fact that in the symptomatic variocoele there is an obstruction to the flow of blood from the spermatic vein caused either by an extension of the growth into the renal vein, or by the pressure of enlarged glands on the veins. The sudden development, therefore, of a variocoele late in life should always lead one to suspect

a renal tumor.—**THE EFFECT OF THE RONTGEN RAYS ON THE KIDNEYS:** Until recently it was supposed that the renal epithelium was quite resistant to the action of the röntgen ray. A recent paper by Warthin is valuable in its addition to our knowledge of this subject. It is based on observations made on two cases of leukemia that had been treated for some time with the röntgen ray. The patients both showed considerable improvement only to die later of what appeared to be a severe intoxication. In both, the greater part of the renal structure was replaced by calcareous deposits. Warthin believes that these severe renal changes are the result of some poisoning arising from the excessive destruction of white cells by the röntgen ray. The practical application of these observations is that the great destruction of leukocytes as it occurs in the röntgen-ray treatment of leukemia may be extremely dangerous. The condition of the kidneys should, therefore, be carefully watched by frequent examinations of the urine.—**THE EFFECT OF FEVER UPON THE RESISTANCE OF THE ORGANISM TO INFECTION:** The exact significance of fever accompanying acute infections has been variously stated. Dr. Barankieva believes that there is a lowering of the natural resistance of the body to the various organisms when the temperature is elevated. This decreased resistance is especially noted toward the organisms which are constantly gaining entrance to the body. She supports her views by animal experimentation, having produced high temperature by the so-called "thermal puncture" of the brain. The natural immunity to certain infections possessed by some animals was also distinctly lowered or completely lost in the presence of fever experimentally produced. These experiments will doubtless throw light on the etiology of mixed infections and perhaps on the increased susceptibility of individuals affected by acute diseases of brief duration with high temperatures to more serious infections.—**CANCER HOUSES:** The Health Department of Paris is investigating the distribution of cases of cancer with the idea of determining if there are houses in which cancer is especially prevalent. Various suggestive statistics have been reported but as yet they are quite insufficient for drawing conclusions. The investigation promises to bring out facts of interest and possibly of significance in the etiology of malignant growths.—**HEART CLOT IN PNEUMONIA:** In the older textbooks the occurrence of heart clot was recognized as one of the

dangers in pneumonia. More recently the phenomenon has been almost ignored. Robinson in a recent communication holds that heart clot may occur during the acute stage of pneumonia when other symptoms are grave, just after the crisis when everything appears hopeful, or during convalescence when all danger is seemingly passed. Pulmonary thrombosis is usually present in connection with the heart clot. If this be so the indication is clearly to reduce the coagulability of the blood. Todd recommends for this purpose six to eight ounces every two hours of a solution of two and a half grains of sodium chlorid and one grain of potassium bicarbonate to the ounce to which a little lemon juice is added. Robinson recommends lemonade itself but especially urges the use of ammonium carbonate not for its stimulant effect but as a valuable prophylactic remedy in relation to heart clot.—**THE MEDICAL INSPECTION OF SCHOOL CHILDREN:** In all parts of the civilized world the public conscience is awakening in regard to the neglect of the health of the young. Great Britain has been almost the last country to recognize in a practical manner that the good health of her children is a national asset of great value. With her population largely urban and so not tending to preserve the health of the young, and her steadily declining birth-rate Great Britain has good cause to care for the health of her rising generation. Medical inspection of schools is an important factor tending in this direction and wherever it has been tried it has been followed by a marked decrease in infectious diseases and by other benefits. At the International Congress of School Hygiene held recently in London this was the main subject of discussion and seems to have aroused Great Britain to institute such measures and to reinforce them with the teaching of hygiene.—**TREATMENT OF RACE-MOSE ARTERIAL ANGIOMA:** This form of neoplasm occurs more frequently in the arteries of the head than elsewhere and is characterized by a tumor mass consisting of newly formed, dilated, convoluted, thickened, and pulsating arteries. They rarely give rise to difficulty in diagnosis and while, as a rule, they are not accompanied by any subjective symptoms, their removal is indicated on account of the disfigurement they cause, their tendency to enlarge and their liability to injury. The different methods of treatment have been discussed by Siegmund, Heyne, Krause, and Körte and all agree that the usual palliative measures are unsatisfactory. Körte has found

that ligation of the main artery limits the bleeding. A mattress suture is then passed through the skin around the entire tumor about two centimeters from its base and the tumor is extirpated within this suture when the latter is removed and the bleeding vessels ligated. Where the tumor is large, the mattress suture is not passed all around the tumor but in a horseshoe fashion and digital compression is made where the suture is omitted. The tumor and skin are then dissected up together and the two then separated.—**INTRATRACHEAL INJECTIONS IN THE TREATMENT OF CHRONIC DISEASES OF THE LUNGS:** This method was first suggested in 1853 by Dr. Green, of New York. For a time it was not taken up on account of the difficulties of technic and of possible danger to the patient. Later Reichert and Jacob, Wendel, Massci, and others have used the method with some success. Galebsky has recently shown by animal experiments that liquids thus injected reach the alveoli of the lungs, the interstitial tissue and the bronchial glands much more surely than the drugs introduced by inhalation. In 17 patients, 14 suffering with tuberculosis, two with putrid bronchitis, one with simple bronchitis, and one with bronchiectasis with beginning gangrene of the lung, the results were favorable especially as regards a diminution of cough, and a diminution in the formation of sputum which at the same time became thinner and so more easily expelled. The intolerable odor of putrid bronchitis soon disappeared and the subjective condition as well as the physical symptoms of all the patients showed improvement. The patients are placed in the position for laryngoscopy and the point of the syringe is introduced beyond the vocal cords under the control of a mirror. Cocain was not used after the first injection and the drugs—chiefly eucalyptol and menthol—were introduced dissolved in sweet almond oil. The patients were then placed on one or the other side, depending upon the localization of the disease in the lungs.

**New York Medical Journal.**—**AN INTERNATIONAL CONFERENCE ON THE SLEEPING-SICKNESS:** This conference held in London in June agreed that the sleeping-sickness is due to the *Trypanosoma gambiense* propagated in the main by the *Glossina palpalis* or the tsetse fly, although other species of flies cannot be excluded. Methods of prophylaxis were outlined and include early diagnosis of the disease for which proper instruction of the native practitioners was necessary, police sanitation

of infected individuals to prevent the transportation of the parasite, the diminishing of the breeding places of these flies and the mechanical modes of protection of houses, closets, etc. The conference approved the use of arsenic in the form of sodium amidophenolate, not as a cure, but because of its apparent specific action in diminishing the number of trypanosomes in the blood.—**AMERICAN FLOUR AND THE VERMIFORM APPENDIX:** For the past few years since disease of the appendix has been so prevalent, many and varied explanations as to its etiology have been put forth. The red rubber theory proposed by an English surgeon seemed to have very little foundation and soon died a natural death. Another English surgeon now gives voice to the opinion that American "white flour" passed between fluted iron rollers often contains particles of iron detached from the rollers and that these, being taken into the intestine, lodge in the appendix and there give rise to inflammatory conditions. This view of the etiology of appendicitis seems also to lack proper foundation inasmuch as the iron rollers used in flouring mills do not shed fragments nor have such particles been found in diseased appendices to any great extent.—**THE PERSISTENT NEEDS OF SAN FRANCISCO:** The fear entertained in San Francisco at the time of the earthquake that sanitary defects more or less dependent on the calamity would arise and persist for a long time has become a reality. The most pressing need is that of an adequate supply of potable water. The streets are in frightful condition beset with pits and trenches and not properly cleaned; garbage is not disposed of and the sewers are in great need of repair. A new hospital is needed within the city and not in the outskirts of the city as now planned. The recent outbreak of the Oriental plague has added another burden.—**THE FERMENTATION OF GLUCOSIDES BY BACTERIA OF THE TYPHOID GROUP:** Twort has recently studied the bacilli of the typhoid group from the point of view of their behavior when grown in media containing a great variety of glucosides. He found that the property of fermentation varied much with different organisms and varied with each organism under different conditions. So that it was possible to change a pathogenic organism by certain methods of cultivation until it gives fermentative reactions characteristic of a nonpathogenic member of its group. This brings up the question as to whether the *Bacillus coli communis* in suitable environment can become converted into the *Bacillus typhosus*. The fact

that Twort has thus been able to change the fermentation characteristics of the members of this group emphasizes the importance of preventing the pollution of potable water-supplies with human feces and urine.—**CHLOROFORM IN WHOOPINGCOUGH:** De Rothschild and Brunier some months ago recommended inhalations of chloroform up to muscular relaxation to control the paroxysms of whoopingcough. Weigert has recently justly criticised the use of this agent on account of the dangers of chloroform anesthesia. It is therefore recommended that the method should be thoroughly tested before given universal application.—**ERUCTATIONS:** Hayem has suggested the title of "sialophagy" for the eructations of gas from the stomach occurring chiefly in nervous subjects. He chooses this term because he finds that the air is really carried into the stomach by the saliva, of which there is an overproduction in these patients. The act may complicate various morbid conditions of the stomach which react upon the nervous centers so as to cause the flow of saliva. The matter seems to be of importance as revealing the existence of a nervous disturbance which later may develop into some serious condition. The early recognition of its cause should, therefore, lead to the adoption of a regime for the relief of the underlying pathological condition and so prevent the evolution of a graver affection.—**MILK AS A VEHICLE OF INFECTION:** There has been no lack of literature during the past few years on this subject though the greater part of it has consisted of individual communications. A systematic investigation is now being made by the United States Public Health and Marine-Hospital Service at the direction of the President and the Secretary of the Treasury. The investigation will deal especially with those diseases usually transmitted by milk, as, for instance, typhoid fever, diphtheria and scarlet fever, but will also include other diseases in which transmission by milk is not so common. An interesting and instructive report may soon be expected as the result of this work.—**THE COAGULATION TIME OF THE BLOOD:** As yet there has been no standard method for determining the coagulation time of blood however important such a determination might be as a preparatory examination in certain surgical procedures. Hinman and Sladen have recently reviewed the various methods and find that the most practical methods are that with the Boggs modification of the Brodie-Russell instrument and a modification of the Millian's slide method. These methods gave results which were closely comparable. In cases of

catarrhal jaundice, the coagulation time was what they considered normal, that is, from five and a half to six minutes. In obstructive jaundice due to cholelithiasis, it ranged from five and a half to twelve and a half minutes, while in the same condition due to malignant disease it varied from nine to twenty and a half minutes. The time was increased in typhoid fever, though after hemorrhages in this disease the time was shortened. In cases of hemophilia the time varied from 11 to 23 minutes. After the administration of calcium lactate the coagulation time is shortened though this influence of the drug wears off after a time. The administration of citrates delays the coagulation time. Meyer Solis-Cohen in a recent study with Wright's newest instrument reports negative and unsatisfactory results.—**SHIP DISINFECTION AT HAMBURG:** Now that San Francisco is threatened with an outbreak of the plague it will be of interest to note the precautions taken by the German Republic of Hamburg to protect itself against infectious diseases brought to its port from over the sea. To destroy rats and their parasites, rat fleas, which represent the principal means of spreading the plague, carbon monoxid gas is used. The State of Hamburg has now constructed a vessel for this purpose which is equipped with a generator of carbon monoxid gas to be used for the killing of rats, another apparatus for generating formaldehyd-carbon monoxid gas used in disinfecting cabins, empty holds of ships, and such merchandise as will not be injured by formaldehyd gas, and a third apparatus for supplying steam for the disinfection of bedding, linen, clothing, etc.—**FAT EMBOLISM:** With the addition of Sharlack R to the list of stains a method has been found for the characteristic staining of fat emboli. In fat embolism there are two modes of death. Patients who die a few hours after the receipt of the injury suffer from a massive embolism of the pulmonary vessels, the clinical symptoms being those of shock or asphyxiation. Those who survive 24 hours or longer, while they suffer from pulmonary embolism, have also widely distributed fat emboli in other organs, particularly in the brain and in the heart. Here the clinical manifestations are those of a lesion of the central nervous system. The fatality of fat embolism seems to be determined by the amount of fat absorbed and the time required for its absorption. Absorbed in small amounts the fat is eliminated through the kidneys and by the phagocytic action of the leukocytes.—**KERATIN:** Unna and

Golodetz, of Hamburg, have come to the conclusion that the horny substances are chemically and anatomically not identical and that they contain elements which react differently to digestion, solution and stains. They have been able to isolate three kinds of keratin which they designate as keratin A, B, and C, all three indigestible in pepsin and hydrochloric acid but differing among themselves in their action to fuming nitric acid.—**DECEPTIVE ELEVATIONS OF TEMPERATURE:** Dr. Kerley has recently recorded a number of facts in justification of occasional disregard of the thermometric record. Elevations of temperature in children are frequently unassociated with any other signs of disease and are probably occasioned by fatigue, excitement, etc. When there is present some disease to account for the existence of fever, the author remarks, the degree of fever is not necessarily an index of the gravity of the disease. To reduce fever Dr. Kerley does not fear to use the coaltar antipyretics in small doses but prefers hydiatic measures if available.

## NEWS AND NOTES.

**A Case of Simulation.**—Justice Brady of the New York Supreme Court has affirmed the sentence of Alpheus S. Frank, an attorney, who was recently convicted of subornation of perjury by a jury in the Westchester County Court, and sentenced by Judge Platt to a term of three years in Sing Sing prison. Frank, who was formerly a chief clerk for the claim department of the New York City Railway Company, was found guilty of preparing a fake trolley suit brought by one Mae Herbert, of New York, against that company for damages for personal injuries. On the trial it was shown that Miss Herbert had sued under a false name, as she was in reality the wife of Abbott Woods, who was conductor of the car from which she claimed to have fallen. It was also shown that the woman was formerly a circus tumbler and contortionist, which enabled her to leap from cars at full speed without hurting herself. She had an old injury, received by falling from a trapeze, which she exhibited for the purpose of proving her case; and it is said that she had figured in several successful suits of the kind before her identity was discovered.

**Outheroding Hahnemann.**—The *British Medical Journal*, in making an investigation of some of the British public's favorite quack remedies, gave the result of an analysis of a

bottle of 200 pills largely sold in England. The most careful tests failed to reveal the presence of any drug, the pills being pure sugar without any admixture whatever. The bottle of 200 pills, which were made in America, sold at retail for a shilling.

### Civil Service in Emergency Hospitals.

—The Board of Health, of San Francisco, has decided that hereafter surgeons of emergency hospitals must procure their position through civil service and positions may be held two years. In case of vacancy in the office of chief surgeon, the vacancy will be filled by the Board of Health from the surgeons on duty.

**The Illinois State Board of Health** in a recent bulletin, calls attention to the fact that the law provides a fine of not less than \$1 nor more than \$100 for failure to report births, and suggests that concerted action on the part of State's attorneys, whereby all violators would be prosecuted, would render indifference to this particular law an exceedingly expensive matter to many physicians.

**Forty of the druggists of Topeka, Kans.,** have been examined by the county attorney, and several of the number have admitted that their chief revenue was derived from the sale of liquors. One druggist said that in the month of July 94 percent of his receipts came from his traffic in liquors, amounting to more than \$1,400. His prescription business for the month amounted to \$4.50.

**The Chicago Isolation Hospital** was closed on August 20 because of the lack of patients. Since December 20, 74 smallpox patients have been under treatment at the hospital. The largest number registered was on March 20, when 20 patients were in the hospital. Not one of the attending physicians, nor one of the thousands of visitors nor of the 2,000 medical students who visited the hospital, contracted the disease.

**A Young Mother.**—A colored girl of Steubenville, O., aged 11 years and 8 months, gave birth to a male babe at full term on September 19, and is therefore one of the youngest mothers on record. The little girl was taken ill while testifying as a witness before the grand jury; she was removed to her home and in a few hours became a mother. The little mother and child are doing well.—*Ohio State Med. Jour.*

**Cancer and Gelatin.**—A dispatch from Budapest says that Doctor Haler has secured beneficial results in cancer cases through injections of gelatin. In 40 cases so treated, Doctor Haler was unsuccessful in only three.

# American Medicine<sup>b1 2</sup>

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**The winter improvement of the tuberculous** is mentioned by Dr. S. A. Knopf,<sup>1</sup> in a most valuable article, devoted to the means of keeping patients practically outdoors both day and night. One phthisiotherapist is quoted as saying that the reason for this phenomenon in the Adirondacks is the absence of bacteria-laden dust, which is covered up by the snow. This explanation does not explain, because the improvement is very marked before the snow appears. Another reason quoted is the large amount of oxygen inspired in a given volume of the condensed cold air, although here also the improvement is noticed in the fall when the increase of oxygen is too small to be a factor.

**Cold is needed for the tuberculous,** and Knopf, says that it is beneficial because it "stimulates all the functions of the body to greater activity." This may be true in the sense that races evolved in the north need cold air, but it is doubtful whether tuberculous negroes should be so exposed—it is too far from the normal climate to which they are adjusted. Cold reduces vital activity in both plants and animals. It is the opposite of stimulating to a house fly. Yet in the case of man, whose temperature is not changed by the external air, cold does seem to be the beneficial factor, but how it acts is a mystery. We do not understand why Knopf should injure the effect by compelling the patient to

"place his chair where his body can be bathed by the rays of the sun, while his head remains in the shade." The sun heated air cannot be as good as cold air.

**The dangers of too much light in tuberculosis** are mentioned by Dr. T. W. Burton-Fanning, in his work on "The Open Air Treatment of Pulmonary Tuberculosis" (page 96). "In the summer it is equally essential to provide protection from the sun. Nothing is more powerful to produce headache, anorexia, prostration and even fever than exposure to the glare of the sun." This should be taken to heart by those who advise unstinted sunshine. No one has mentioned the fact that there is less sunlight in winter than in summer. If sunshine is essential, improvement should be found in June, the lightest month, whereas it is apparently greatest in December, the darkest.

**Is Our Summer Light Harmful to the Tuberculous?**—Phthisiotherapists must be consistent and find out the proper dosage if it is ever beneficial. They get the best results in the dark cloudy mountains and in the dark winter, and yet they repeat, parrot-like, the old dogma about needing unstinted sunshine, which from centuries of experience in East India is known to be fatal. If light is so essential, why is there so much benefit from sleeping outdoors at night? Knopf and others mention the feeling of well-being in the early morning. The daytime seems to be actually exhaust-

<sup>1</sup>N. Y. Med. Jour., May 25, 1907.

ing even for the bedridden. It is well known that the results in the sunny South are not so good as in the cloudy North, and here and there they are positively bad particularly in the case of marked blonds, but the facts are concealed, for the commercial exploitation of lands of perpetual summer, heat and sunshine.

**Reversal of opinions** is characteristic of the history of medicine, and cannot be better illustrated than by this new knowledge as to the winter improvement of the tuberculous. Time and again has it been necessary for the profession to change its methods of treatment to the opposite of long-established orthodox practice. The old plan was to keep the tuberculous outdoors in summer and house them in winter or send them south. Now we must expose them to the northern winter and protect them from the sun in summer. It is also time to investigate the alleged benefits of the solarium and see if it is not as harmful as the summer sun.

**The actinic fever of the tuberculous** is mentioned by Dr. Jno. E. White,<sup>1</sup> of Colorado Springs, Colorado, who says: "If the patient is passing through the summer, he should always seek the coolest place and avoid direct sunlight, as sitting in it will invariably bring the temperature higher. The so-called 'sun-bath' we have proven to our entire satisfaction to be detrimental. We have repeatedly taken the temperature before and after patients have been placed in the sun, and we have almost invariably found the temperature to be higher." It is also well known that patients are always better in the morning after a night of soothing darkness, but worse in the evening and that the fever is up after several hours of sunshine. Experiments on lower animals

long ago proved that light increases metabolism and is exhausting.

**Dreadful advice to the tuberculous**, is that of Dr. J. W. Wainwright, the editor of the *Hygienic and Dietetic Gazette* (October, 1907), "those suffering from tuberculosis should seek the sunshine rather than the shade." If the facts are as stated by Burton-Fanning and White, the treatment advised by Wainwright would be fatal to some cases which would otherwise be cured. Once before we were compelled to call attention to Dr. Wainwright's dreadful advice as to sunshine, for in the June issue of his *Gazette* he stated "we are content to leave the wisdom of an abundance of sunshine for man, *whether sick or well*, to the judgment of all medical men as well as sanitarians and teachers of hygiene." He now in the October issue calls attention to the fact that his "remarks referred alone to advice given, that those suffering from tuberculosis should seek the sunshine" and under the heading "as brown as a berry" states that in case of the healthy there should be protection from the sun's rays, which by their actinic effects do harm to the nervous system. It is simply amazing that anyone would advise exposing the sick to that from which even the well must be carefully guarded. And what can be said of Dr. Clarence L. Wheaton,<sup>2</sup> of Chicago, who says that "the ideal climate would be the one possessing the greatest possible amount of sunshine," when he should know that for a third of a century Trudeau has been obtaining the best results in the world in the Adirondacks which are noted for the absence of sunshine. Wheaton is attending physician at the Olivet Dispensary, Chicago Tuberculosis Institute, and argues for "the value of sunshine in the arrest of tubercu-

<sup>1</sup> Arch. of Physiological Therapy, October, 1906.

<sup>2</sup> Diet. and Hyg. Gazette.

losis," and if he really exposes his patients to what is now known to be harmful to them, we commend his cases to the trustees of that institution.

**The open air for tuberculosis of bones and joints** is shown by Dr. John Carling,<sup>1</sup> of the New York Hospital for the Ruptured and Crippled, to be the only treatment. Children must be daily exposed to cold air except in stormy weather even if they are feverish and bedridden. The interesting part of his paper is the statement that practically all the European institutions are located on the sea-shore, but the American experience shows the inland sanatoriums to be far more successful than those at the sea-shore, the former reporting about one-third cured and over one-half improved, while the sea-shore has less than one-fifth cured and something over one-half improved. He states the orthodox opinion of the necessity for the maximum amount of sunshine and exposes the little patient to the sun, but it is quite possible that it is the sun at the sea-shore which prevents better results, and that he would obtain even more cures at the forested inland sanatoriums if he would protect his little patients from the summer glare. It has already been noticed that the blond children do not receive as much benefit from the cold air of the sea-shore as the brunets, and the reason is self-evident.

**The backwardness of phthisiotherapy** can best be illustrated by the slowness in adopting the modern treatment in cold air. Dr. George Bodington, "an obscure country practitioner" of Sutton Coldfield, Warwickshire, England, in 1840 published this method and stated that the cold of England is never too intense. We now know that the lower temperature of the Adirondacks

is not too intense yet the English profession bitterly opposed him, called him a lunatic and drove the patients from his sanatorium—thus closing the first of its kind. In 1855, Dr. Henry McCormac, of Belfast, was persecuted by the Irish profession for holding similar views, and Brehmer, the founder of the modern treatment, received the same contemptable opposition in Germany, even after 1859, when he proved its success in the sanatorium at Goerbersdorf in Prussian Silesia, established by him through the influence of Humboldt and Schönlein. He never received a bit of recognition from the government for the invaluable good he did for the nation. Think of the tuberculous who have been needlessly slaughtered since 1840, by reason of our criminal opposition to these three pioneers! At present the medical "authorities," in opposing Burton-Fanning and White, as to the harmfulness of excessive light are just as criminal as the authorities of 1840, and Dr. Wainwright approvingly quotes these old authorities and ignores the facts. Even Jno. P. Huber<sup>2</sup> who deplores the present practice of sending patients south, away from the curative conditions, still advocates harmful sunshine. The whole matter illustrates the viciousness with which new medical ideas are almost invariably opposed, and the slowness with which the profession accepts newly discovered facts of vital importance in therapy.

**The difficulty of abandoning false ideas** is very nicely illustrated by a remark of Dr. Thomas Darlington, of New York in an address to the American Climatological Association.<sup>2</sup> He mentioned the good results of the outdoor treatment in the sanatorium on North Brother Island, where the

<sup>1</sup>N. Y. Med. Jour., June 8, 1907.

<sup>2</sup>Consumption and Civilization.

<sup>2</sup>N. Y. Med. Jour., June 22, 1907.

climatic conditions are "distinctly unfavorable," advanced and apparently hopeless cases being cured. Then he said that this took place "despite climate." It seems more logical to reverse the matter and call the conditions distinctly favorable if they are curative. What was once considered bad climatic conditions are now known to be the best, but it will take a long time for the profession to reverse its ideas.

**Opaque clothing is needed in excessive light** according to Dr. Louis W. Sambon, Lecturer in the London School of Tropical Medicine. He describes a special fabric invented for the purpose, the outer surface being of a light color to reflect as much heat and light as possible and the inner opaque so as to prevent the penetration of the actinic rays.<sup>1</sup> The *Journal of Tropical Medicine* disgraced itself in 1905 by publishing a foolish article by a Lieutenant-Colonel Giles who claimed that it was mischievous to say that light was harmful. In its issue of Feb. 15, this journal shamefacedly tries to make up for the harm it has done, and acknowledges that excessive light is so harmful to northern races, that opaque clothing is needed in lieu of the skin pigmentation which is provided for natives of light countries and which has long been known to exclude the ultraviolet and other actinic rays. The poor layman must be in despair to learn from one hygienic journal to expose himself to unstinted sunshine, and from another to protect himself from it. The practical point seems to be the need of opaque clothing for the tuberculous, particularly the blond types in sunny climates, and this end is accomplished in the tropics and particularly for the blond tuberculous, by the use of dark underclothing to stop the light, and cool light-colored outer gar-

ments to reflect as much as possible. The editorial in the *Journal of Tropical Medicine* seems to be a mere advertisement of a cloth which will be intolerably hot.

**The autumnal southern migration of the tuberculous** is the result of the old orthodoxy. If it is true that the cases are injured by too much heat and sunshine, but improve in the cold dark winters of shady, cloudy mountain forests of the north, physicians should stop sending their patients south to perpetual summer heat and excessive sunlight. Every autumn thousands of northern tuberculous patients thus run away from the cold, which, according to Knopf, is the very thing they need. The mortality among these migrants is a scandal. It is rumored that the undertakers do a thriving business sending corpses home from some of the southern health resorts noted for perpetual sunshine. Cannot something be done to stop this fatal autumnal southern migration?

**Farming on waste city lots** is the splendid idea fostered and practised by the Philadelphia Vacant Lot Cultivation Association; and by a similar movement in New York City. Not only does it give poor people a chance to raise a little fresh vegetable food for which they suffer, but it does far more good in the way of inducing them to get outdoors to escape the disease-breeding, hot, ill-ventilated rooms of the tenements. It is getting back to nature. In its ten years of existence, this society has already done incalculable good in improving the health of some hundreds of city folks whose lives are ordinarily so unwholesome because so unnatural. Let the good work go on. It is the highest form of charity to help people to help themselves. The work should be extended in the direction of helping these poor, crowded, city dwellers to get homes in the suburbs with

<sup>1</sup> Jour. of Trop. Med., Feb. 15, 1907.

a bit of garden to cultivate. This is the plan adopted by certain associations in England where land hunger is older and acuter. It is time to adopt it here and make an effort to scatter people from the congested areas which fill our hospitals, poor-houses and jails.

**Gardens for the tuberculous** have also been made a part of this new movement, for the sole purpose of getting the sufferer outdoors. Undoubtedly it is infinitely better than life indoors, but it is well to go slow in this part of the matter, in view of the evidence that the tuberculous do not improve in summer at the very time that harmful sun exposure is inevitable in gardening. Outdoor winter employment is needed, and the summer occupation, if any, should protect them from the factors which are preventing improvement. Likewise the new charity of finding outdoor employment for the convalescents or the cured, to prevent them returning to the indoor labor which caused the disease, should not select injurious employments requiring hard work and sun exposure in the summer. It does seem that gardening is contraindicated unless something better is not available. The further south, the more harmful gardening will be. In the tropics it is fatal for the northern races. The position of motorman on a trolley car has been used for the cure of incipients and the suggestion of similar employments deserves consideration for they escape the "unstinted" sunshine of summer.

**Prolonged latency of tuberculosis** is now being suspected by more than one thoughtful physician. Dr. Chas. F. Besson, of Boswell,<sup>1</sup> N. M., in a valuable article quotes the opinion of Professor Cornet, of Berlin, to the effect "that the very earliest period at which physical signs become known to us is from

six months to one and a half years after the implantation of the germ." What an enormous amount of good could be done if the medical profession would take this to heart! The treatment of this highly curable stage is really the common sense method of living, ordinarily called hygiene. Long before the diagnosis is possible, the disease should be suspected, and as the treatment is so simple it should be carried out at once. The majority of patients would really never know positively that they had the disease.

**A paradox of sanitation** is explained by Knopf's epoch-making paper. The increase of tuberculosis in the navy has been deplorable but in the old sailing-ships it was practically unknown, although the sailors were badly treated, much overcrowded in the dark, ill-ventilated lower decks, had bad food and were not so carefully selected as now. The more the conditions are improved the worse the disease becomes, but the explanation is evident. The effect of all the improvements seems to be ruined by the steam heat which is introduced throughout the ship. The old style sailor, breathing cold air, and never living in heated rooms, was apparently so vigorous from this cause that he was not injured to a great degree by any of the factors usually considered harmful. Of course, he had other diseases and epidemics of ship fever were now and then dreadful, but the cold air prevented tuberculosis. The same phenomenon has been observed in farmer families who become prosperous, build modern overheated and overlighted houses and then battle with diseases unknown when they lived in the old draughty cold log house. In other words, cold is not only curative, but preventive. It may be the only factor needed in the early stages when incipency is merely suspected. The old

<sup>1</sup> Jour. Amer. Med. Ass'n., Mar. 16, 1907.

life of the sailor was formerly regarded as curative. Suspected cases were sent on a long sea voyage for that purpose but they promptly get worse in the hot, modern ship.

**Postgraduate correspondence medical schools** have been suggested but contemptuously ignored by the medical profession, though the idea is well worth considering in view of the difficulty, if not impossibility, of many a practitioner sparing the time necessary to visit a distant city for the usual short postgraduate course. It has been left to a nonprofessional correspondence school to take up the matter and offer instruction to physicians in a certain specialty. It is a most anomalous state of affairs and should be promptly remedied. There is no doubt, whatever, that in many special studies the regular medical schools and medical associations, with their wealth of current literature, standard libraries and available experts, could supply this great and crying need of the country doctor. He could thus be so well grounded in the essentials that if he does find it possible to supplement it with some clinical instruction later, he will be able to profit by it to a much greater degree than at present. The idea is in line with the trend of thought in regard to making medical education cheaper and more available to that lay class which cannot possibly take the tremendous modern courses suitable only for the rich who can spare the time. Regular universities offer correspondence courses and give degrees or certificates, and it does seem practical for their medical departments also—at least to a limited extent in the postgraduate specialties. The correspondence department of certain medical journals is quite large. The questions show the great need of the instruction requested by the writers of the letters, and the answers show the need of instructors.

**The recent acquittal of Judge Loving** is of tremendous medicolegal importance, and of vital interest not only to the general practitioner but to the psychologist as well. It is now a legal precedent that all a murderer need establish for a valid defense, is true or perjured testimony that he was told the victim had assaulted or attempted to assault a member of the murderer's family. The prosecution is not permitted to prove that the testimony is perjury and that the tale was never told. It cannot even prove that, if it is true testimony, the tale as originally told to the murderer was false. It is accepted that intense emotion aroused by the recital of the true or fictitious wrong, unbalances the mind to such an extent that responsibility ceases, and that the emotion is too great to expect a man to find out if the story is true.

**The safeguards of civilization are destroyed** for no one is now safe. In wild communities, a newly made widow sometimes receives an apology from a lynching committee when they have made a mistake, but the whole fabric of civilized law is to make such mistakes impossible. The very basis of law and order is the invariable ruling that a man is responsible for his acts, and if in hot blood he kills without legal reason, he must suffer the penalty of imprisonment to deter others from giving way to their passions. If a man is of such a nervous organization that he is unable to restrain his passions, he is unfit to be at large for he is liable to kill many more.

**Psychic epilepsy** has occupied the attention of the public on account of the acquittal of an epileptic physician who, while in the psychic equivalent of an epileptic spasm, attacked and injured some people. The disease is of course a long known one, but the public had evidently never heard of it.

What has deservedly occasioned comment and even alarm, is the fact that such cases are permitted to be at large, liable to kill some one in the next seizure. The fact that the sufferer is a physician, makes it doubly alarming. Public safety is of more moment than the liberty of one person who menaces the public. It seems that there is need of a revision of such legal decisions. Indeed common sense dictates that an epileptic be guarded against self-injury.

**Playing upon the jury's emotions** is an old trick of the attorney, but it seems to be in danger of such abuse as to call for condemnation. The jury system is demanded where the people actually or representatively make the laws, and it persists because those who make the laws reserve the right to interpret them. If emotion guides the making, as undoubtedly it sometimes does, then emotion guides the interpretation. Sympathy and hate enter into some of our laws and quite naturally, a man whose sympathies or hates are contrary to those of the vast majority of his peers, is necessarily antisocial and bound to be condemned, while he whose emotions are similar to those of the mass is excused, no matter what he does in abedience to his emotions.

**A recent conviction in New York State** of a young man charged with murder contrasts strangely with the acquittal of a young woman in New York City for an almost parallel crime. These results of emotional trials are bad enough, but it certainly grates upon one's sense of justice to see the attorneys making use of these natural emotions of the jury to secure verdicts unwarranted by the evidence in each case. It is now openly confessed by many lawyers that they cannot secure a verdict unless they ignore cold facts and appeal to the feelings of the jury. The dangers to society are self-evident when

criminals can thus escape or be unduly punished. The psychology of the jury deserves more attention from psychologists, though it is the daily study of the lawyer. The opening remarks of the prosecuting attorney, not infrequently tend to condemn the accused in advance.

**A Bloody, Causeless, Victoryless Butchery.**—There is no better illustration that the interests of the public are irrational and immoral than the utter disregard we have of the deaths and injuries from railway mismanagement. If a worthless man or woman is killed a whole community is excitedly interested in the affair, and the trial of the good-for-nothing murderer may cost a fortune, and absorb the attention of a nation. If a bit of a quarrel with another nation results in a few hundred deaths, whole nations are frantic. And yet who cares or notices that last year 5,000 were killed in our railroad "accidents," and 76,286 were injured? Who is shocked to learn that the killed this year are 775 more than last, and that about 10,000 more were injured? Doubtless some accidents are unavoidable, but just as certainly most are avoidable. But only on condition that we wish to avoid them! Few things more eloquently justify the cynical grins of the pessimists than the callous way in which modern luxury sacrifices life.

**The animus of the Journal of the American Medical Association**—of the present rulers of it—could not be better illustrated than in its action toward the Association of Medical Librarians. The librarians are engaged in a serious, unselfish, and needed attempt to forward scientific and literary medicine. But, of course, such an aim is not popular, and so the so-called "leaders" have no interest in the movement. Hence the *Journal of the*

*American Medical Association* does not aid the librarians, and even cuts off the gift of the *Journal* to its membership libraries. The Association of Librarians gets more sympathy and help from the independent medical journals (which the *Journal of the American Medical Association* is trying to kill) than from the rich journal supported by the great body of the medical profession. When the profession tires of this sort of abuse, and of many abuses of a similar kind, it will demand a very different policy from those who now misrepresent it. But will it ever tire? Or when it does, may it not be too late? It seems to have created a Frankenstein.

**A naive exhibition of double dealing** is made in a composite book now issuing from the press. A certain "eminent professor" has long taken pride in his office of "Apostle of Therapeutic Nihilism." He has by his cynical pessimism in regard to the use of drugs and practical therapeutics, helped to reduce the active, and especially the country, practitioner to the menial office of a mere referrer of patients to the city specialist. The eddyites and "drugless healers" of a hundred kinds have had great encouragement from this prophet, and have never tired of quoting his brilliant untruths and epigrammatic nonsense. No wonder, therefore, when he issues a needless and useless new "System of Medicine" his publishers are alarmed lest the buyers may not buy as desired, and that they shall demand books that help them to treat and cure disease. Rightly enough they say that the cure of disease is their distinctive function, and that the intelligent and discriminating study and use of drugs is of immense medical use and practical advantage. So the individual writers of the big composite "System" are instructed to go

most sympathetically into the questions of practical therapeutics and the treatment of disease by drugs. Then, while the "System" is being issued, the scorner of drugs and therapeutics in a public address makes game of us all by sneering at the Pharmacopeia and laughing sardonically at drugs and the curability of disease! Few there are that can so happily contribute to the gaiety of nations—and of medicos. Sins are not cured by the sinecurist.

**E. Ray Lankester's amazing omission** to note the American achievement in conquering yellow fever has created considerable ill feeling in those who have read the series of addresses now published under the title of "The Kingdom of Man." He does mention American scientists more or less, but in the list of the great discoveries, which enable us to escape dangers which were formerly fatal, and to live in places where we never could before, he fails to mention the greatest discovery since that of the cause of malaria. We have always sympathized with Lankester on account of the cavalier treatment he received from the trustees of the British Museum—an affront somewhat effaced later by the title so diplomatically conferred by the king—yet, perhaps there may have been some ground for the action after all, if he is so careless or opinionated as to offend Englishmen as much as he has Americans.

**Man's rebellion against natural selection and his defiance of nature** is Lankester's latest confession of faith, and it does seem that he has been unfortunate in the use of words or has not conveyed his meaning, for man is far from rebellion. Animal and plant species survive either by developing a physique which can resist dangers, or by developing habits of escaping and avoiding. The white ant hides from

the light because it is unprotected by pigments. It does not rebel but is obedient to nature. Man's brain allows him to learn of dangers and avoid them, and he too is obedient and not defiant. A type of man is thus being evolved who cannot expose himself to danger like his prehistoric ancestors. We cannot "get back to nature," that is, the environment of the savage, and we ought to be very thankful for this disability. But we are obedient to natural laws, just the same, and suffer death for disobedience. The natural environment suitable for us is constantly changing, and that's all there is to his remarkable error of statement or opinion, whichever it is. Houses are now needed instead of caves, clothing of fabrics instead of furs, cooked foods instead of raw, and—Heaven help us—boiled water to drink for we are pouring sewage into every sparkling brook and crystal lake. If we lived and ate and drank like our savage ancestors, we would all be dead in six months. If healthy, we are close to nature and always will be; danger exists in getting away from what is normal for us. "Back to nature" means dodging unnatural things we now tolerate in the way of bad or infected air, food, and water—the dreadful, crowded, unwholesome city life.

#### **Relations of Physician and Patient.—**

There are few men in this country whose opinions command more respect from a greater proportion of our people than Ex-President Cleveland. It was to be expected when he consented to address the Medical Society of the State of New York on the occasion of the celebration of its centennial anniversary, that he would say something more than the merely conventional and that his address, far from being only formal, should contain a message

worthy of the man and of the occasion. The burden of that message is a plea for more candor and openness in the relations between physicians and their patients. As Mr. Cleveland put it: "We have come to think of ourselves as worthy of confidence in the treatment of our ailment and we believe if this is accorded to us in greater measure it would be better for the treatment and better for us. We do not claim that we should be called in consultation in all our illnesses but we would be glad to have a little more explanations of the things done for us." Of course the opinion of any single individual of the general conduct of physicians must depend to a great extent on his personal relations with a few physicians. Mr. Cleveland, we think, however, can be trusted not to have formulated his message for physicians without having considered more than the personal side of the question. His experience in writing messages on important matters has surely taught him this and, therefore, his opinion has a much wider significance than that of the ordinary individual who sometimes does not realize how narrow his experience may be. The ex-president has hit on one of the modes of progress in medical practice that is perhaps the most marked in the external relations of physicians and patients during the last century.

**Mystery in Medicine.**—It used to be the custom something more than a century ago for the physician, when called to a patient, to put on an extremely mysterious air, to wear a special seer-like garb, say practically nothing while he was in the sick room, feel the pulse, look at the tongue, taste the urine, and then look wise and go home to prepare the wonderful potion that was to cure the affection so profoundly studied. There was none of that intimate accurate

examination of either the thorax or abdomen which teaches the modern physician so much, and it is probable that these old-time practitioners would consider any such manipulations quite beneath their dignity. All the apparatus of mystery, external and internal, have been dropped by the physician, as he advanced in real knowledge. There still remains, however, a definite tendency to consider it better for the patient that he should not know too much about his ailment or about the treatment of it. It is true that the writing of prescriptions in Latin is not maintained entirely for the sake of the supposed secrecy which it secures, but this is still one of the main reasons. Patients, as a rule, even when some confidence is extended to them in regard to the details of their illness, are usually not told much about the method by which the physician hopes to secure the amelioration of symptoms and the ultimate cure of the disease. There is a large group of modern physicians who consider it quite inadvisable to extend any such confidence to patients, since, as a rule, the appeal to a patient's reason has not so much good effect on him as the appeal to his faith and confidence in his physician has in securing the more indefinite mental effect which is an important factor in therapeutics. There are many physicians who, when ill themselves, prefer not to know the exact details of their treatment, but choose to leave these to the attending physicians without confiding in them.

#### **The Need of Mutual Confidence.—**

There have been other protests in this matter beside that of Mr. Cleveland. Many of the satires on physicians which have appeared in recent medical literature emphasize especially this particular and picture the physician as in solemn silence

pretending to a knowledge that he has not. Many of the writing class in our population (an ever-growing tribe) are apt to express something of this same idea when occasion permits. It is evident that as Mr. Cleveland put it they do not like to think of their "doctors as veiled prophets or mysterious attendants shut out from all sick-bed comradeship, except through cold professional ministrations and all the time irresponsive to our utmost need of sympathetic assurance." If the old-fashioned secrecy prevails, "It should not be considered strange," he adds, "if thousands among us, influenced by a sentiment just now astonishingly prevalent, should allow ourselves to be disturbed by the spectre of a medical trust in mystery and like all who are trust affrighted should cry out for greater publicity between physician and patient." It would seem, then, that the twentieth century physician might well take to heart something of the warning that comes from a disinterested but thoroughly well-affected outsider. True science is above all things frank, and though medical practice is still an art as well as a science, if there has been a yielding to old-time traditions rather than to the tendency to scientific candor, good may be accomplished by recognizing it. We no longer consider it so necessary to conceal the beginnings of tuberculosis from patients as used to be thought expedient, and the results of our straightforwardness have been eminently satisfactory. We thus secure the complete cooperation without which treatment would be hopeless. There are other lines in medicine in which a similar movement has been noticed. It seems not unlikely then that a lesson for the medical profession of the new century is conveyed by these words of the ex-president with a gentle friendliness that makes it readily acceptable.

## BOOK REVIEWS.

**Manual of Diseases of the Eye.**—By CHARLES H. MAY. Fifth edition, revised, with 362 original illustrations. Wm. Wood & Co., New York, 1907. Price, \$2.00 net.

That this manual has passed through five editions in seven years and has been translated into four different European languages is sufficient evidence of its excellence. In this latest edition the text has been carefully corrected, the illustrations improved, and a new colored plate added. The book has been kept up to date without increasing materially its very convenient size.

**Foods and Their Adulteration:** Origin, Manufacture, and Composition of Food Products; Description of Common Adulterations. Food Standards, and National Food Laws and Regulations.—By HARVEY W. WILEY, M. D., Ph. D. P. Blakiston's Son & Co., Philadelphia, 1907.

The subject of food adulteration has attracted much attention and serious consideration during the last two years in the United States. Pure food had become so scarce before publicity opened the eyes of the people and compelled the law makers to pass laws, stringent in character, that it seemed little but adulterated foods could be purchased in an ordinary grocery. The crusade made by Dr. Wiley in the interest of pure food is well known, and his experience has enabled him to write a book which will be the authority on this subject for many years. This book not only discusses food adulteration but includes information regarding methods of preparation, manufacture, food values, standards of purity and regulations and decisions of the department governing inspection of foods. The public owes much to Dr. Wiley for the energy he has displayed in bringing about the pure food laws—and it owes him still more for the immense amount of practical information, much of which has been hidden hitherto in government reports, which he has made available to the seeker for information.

**Diagnostics of the Diseases of Children.**—By LE GRAND KERR, M. D. W. B. Saunders Company, Philadelphia and London, 1907.

If diagnosis is often difficult in the adult, where we have the advantage of receiving a more or less clear statement from the patient of symptoms and previous conditions, how much more difficult must it be in infants and young children, where the physician must depend almost wholly upon symptoms and physical signs that are evident to his senses alone. It is with these objective symptoms of disease in childhood that Dr. Kerr's book deals. Instead of being a systematic treatise on the various diseases of childhood, as most works on pediatrics are, this book is a systematic treatise on symptoms. It is the symptom which forms the basis of classification, and each possible symptom is considered in all its aspects and its relation to various pathologic conditions. The practical diagnosis of disease in

children is the object kept constantly in view. A feature of great value is the detail which is paid to methods of examination, especially those methods peculiar to the investigation of disease in childhood. The normal conditions, as found in children, are frequently given as a basis for comparison. Dr. Kerr's book should prove of inestimable value, not only to the general practitioner, but also to the physician who intends to specialize in the direction of pediatrics.

**Atlas and Epitome of Diseases of Children.**—By DR. R. HECKER and Dr. J. TRUMPP. Authorized translation from the German. Edited by ISAAC A. ABT, M. D. W. B. Saunders Company, Philadelphia and London, 1907.

It is only necessary to say that this is one of the most recent of the Saunders' Medical Hand Atlas Series, and is constructed on the same lines as the others of the series. This necessarily implies that the plates are unexcelled for accuracy and beauty, and that the text is a marvel for conciseness. Special attention is given to methods of examination, which are fully illustrated. Among the unique features might be mentioned a series of colored plates illustrating the operation of tracheotomy, and another series vividly portraying different types of infants' stools.

**The Common Bacterial Infections of the Digestive Tract, and the Intoxications Arising from Them.**—By C. A. HERTER, M. D. The Macmillan Company, New York.

In this volume are embodied the author's views, with many added details, recently presented at the New York Academy of Medicine. Present knowledge on the subject of gastroenteric infection is somewhat confused, but this volume, which abounds with results of exact physiologic, clinical, and bacteriologic experiments, gives a better insight into the conditions and processes that occur in the digestive tract. The chapter on the dysentery bacillus is especially good.

The last chapter, "Methods Relating to the Modification and Control of Bacterial Processes Concerned in Chronic Excessive Intestinal Putrefaction," is well written, and on account of its positive statements, backed by careful experiments, is worthy of consideration by all practitioners of medicine.

**Diseases of the Rectum: Their Consequences and Nonsurgical Treatment.**—By W. C. BRINKERHOFF, M. D., of Chicago, Ill. Orban Publishing Co., Chicago, 1907.

This book, while claiming to be a treatise on diseases of the rectum, is largely devoted to a defense and exploitation of the injection method—or more specifically, the Brinkerhoff method—of treating hemorrhoids. This method is of course best carried out by means of the patented Brinkerhoff rectal speculum (three sizes) and Brinkerhoff's hemorrhoidal needle. The remedy best employed is the Brinkerhoff "hemorrhoidal compound,

composed of ingredients (not given) which are prepared under a thermometric test (not described) thereby assuring a uniformity of strength, which is very essential to the successful results of treatment." If these articles cannot be obtained from the nearest drug-store, there is a polite invitation to purchase the same directly from the Chicago office. The disparaging tone, which the author assumes in writing of surgical methods and those who practise them, leads one to doubt the honesty of his own motives. In the opinion of the reviewer, this book is unethical; nay more, it closely approaches, if it does not overstep, the borderline of quackery.

**The Climatic Treatment of Children.**—By FREDERICK L. WACHENHEIM, M. D. Rebsman Company, New York, 1907.

This is a practical, useful and handy book, based not alone upon reading, but upon experience, and consequently full of pertinent suggestions and comments. We cordially recommend it.

**Pharmacology and Therapeutics.**—By REYNOLD WEBB WILCOX, M. A., M. D., LL. D. Seventh Edition, Revised with Index of Symptoms and Diseases. P. Blakiston's Son & Co., Philadelphia, 1907.

This is an excellent summary of its subjects, and having gone through seven editions, does not need at this time an extended criticism. The work has been thoroughly revised and modern knowledge incorporated.

**Lippincott's New Medical Series.**—Edited by FRANCIS R. PACKARD, M. D. Röntgen Rays and Electro-therapeutics, with chapters on radium and phototherapy. By MIHRAN KRIKOR KASSABIAN, M. D. J. B. Lippincott Company, Philadelphia and London, 1907.

Kassabian's book is a good one. Profusely and clearly illustrated, well-written, clear and conservative in statement, it brings to bear upon the literature of the subject the practical judgment resulting from large experience, especially in the field of röntgenism. It is, therefore, a welcome addition to the number of textbooks upon its subject.

**Diseases of Infancy and Childhood, their Dietetic, Hygienic, and Medical Treatment.**—By LOUIS FISCHER, M. D., of New York. F. A. Davis Company, Philadelphia, 1907.

Dr. Fischer's book contains nothing new, but is laid down on the wellknown lines followed by other authors of works on pediatrics. It may be regarded as an exposition of the author's clinical experiences, as many cases are described in detail—a feature which adds greatly to the interest of the book. The chapters on infant feeding are quite up to date, and show the present tendency toward simplicity and away from the complicated percentage methods. Dr. Fischer disapproves of top milk methods, but gives a detailed and valuable chapter on buttermilk feeding—a feature

that is novel in text-books on pediatrics. The author as a rule exhibits a good conception of the various diseases of childhood, but occasionally falls into errors which should not exist in a modern text-book. The few words on spasm of the pylorus show a misconception of the pathology, ignoring as they do the hypertrophic feature of this condition. Likewise, there is a confusion of erythema infectiosum with Filatow-Dukes' "fourth disease." The chapters on infectious diseases are undoubtedly the best in the book, a most valuable wealth of detail being given. Many excellent illustrations, both original and borrowed, are included in the book.

**Introduction to Infectious and Parasitic Diseases, including Their Cause and Manner of Transmission.**—By MILLARD LANGFELD, A. M., M. B. Philadelphia, P. Blackiston's Son and Co.

This little volume was written, for the use of nurses, to broaden their comprehension of infectious and parasitic diseases and to assist them in performing their duties more intelligently and satisfactorily. The explanation, to nurses, of the reasons for performing certain duties makes intelligent nurses and is much to be desired. The book is readable and not so technical that it cannot be read and understood by one of ordinary intelligence.

**Diseases of the Stomach.**—By DR. I. BOAS. The Sole Authorized English-American Edition from the Latest German Edition, by ALBERT BERNHEIM, M. D. F. A. Davis Company, Philadelphia, 1907.

Dr. Boas is considered an eminent authority on diseases of the stomach throughout the medical world. It is natural, therefore, that his treatise on this subject, which reflects his views and gives the results of his scientific researches, should be held in high esteem both in Germany and in foreign countries. Hence, this first translation into English of Boas' book should meet immediate favor in America. While representing mainly his own opinions, the views of other authorities have not been neglected, but have been given due consideration. This is especially true of the section on Methods of Examination, which contains a wealth of detail valuable to the specialist as well as the general practitioner. The exhaustive discussion of the anamnesis is especially to be commended. The same attention to detail is to be found in the 120 pages devoted to diet and therapeutics. The rest of the book—less than half—is devoted to the usual systematic consideration of the special diseases of the stomach, the classification of which commends itself for its simplicity. Considerable of value is added to the book by the editorial inclusion of material gathered from recent American sources—a field which is apt to be overlooked by German authors. The index might have been enlarged and improved, as it presents the usual faults of brevity and distorted importance of subjects, found in most German books.

## ORIGINAL ARTICLES.

### MODERN TENDENCIES IN THE TREATMENT OF BONE TUBERCULOSIS.\*

BY

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In no subject in medicine have more radical and astonishing changes occurred than in tuberculosis of the bones and joints. Starting with the then marvelous revelations of Percival Pott in 1779 and down to the very latest methods of blood research, inoculation, and other of the most modern methods of procedure, new discoveries have been from time to time announced that gave promise of definite improvement over preexisting methods. Now, we can look upon the discovery of Pott as being wonderfully thoughtful and accurate. At the present time it may seem strange that the relationship existing between paralysis of the lower extremities and anteroposterior curvature of the spine was not recognized before Pott drew attention to it. It is clearly evident, however, that there was no such recognition until Percival Pott, in 1779, presented his classic paper announcing his discovery. Recently, A. J. Steele,<sup>1</sup> has drawn attention to the pre-existing ignorance of the medical profession of the causes of paralysis of the lower extremities that are now well recognized in caries of the spine. He pays a very proper tribute to Percival Pott and removes all doubt as to the propriety of attaching Pott's name to the diseases of the spine to which he directed attention as the cause of so many cases of the paralysis of the lower extremities. Thus Percival Pott began the real consideration of bone tuberculosis. Very many investigators have since pursued the subject, adding definite clinical data, all of which tended to confirm the views of Percival Pott. Many of the most eminent names in the medical profession are identified with the investigation of bone tuberculosis during the 100 years that followed Pott's dis-

covery. While there were very many changes made in the manner of studying bone tuberculosis, the general principles of treatment were quite the same. Comparatively little attention was ever paid to the beginning of the condition, but the deformities as they became manifest, received attention to prevent increase. As nothing definite seemed to have been known about the etiology of bone tuberculosis, prophylaxis could receive but very little attention. Thus the matter continued until 1882 when Robert Koch, the father of bacteriology, announced to the profession his great discovery of the bacillus of tuberculosis. He found tubercle bacilli not only in lupus and tuberculosis of the soft structures but also in 13 cases of tuberculosis of the bones; thus marking an epoch in the history of bone tuberculosis which established a line of demarcation between the former method of treating symptoms and the method which has existed since of treating the condition now known as being caused by recognizable bacilli. During the last 25 years, very many revelations and discoveries have been made with reference to bone tuberculosis based upon accurate clinical observations, microscopic examinations, bacteriologic investigations and research on man and animals. The results of these elaborate studies have been shown in the various interpretations of their bearings upon the subject and very many diverse methods of treating bone tuberculosis have been advocated. For a long time certain forms of tuberculosis of the joints were considered in the form of three stages with efforts to base the so-called clinical phenomena of the various stages upon definite pathologic foundations. It is only within the last few years that this erroneous method has been abandoned because of the definite determinations that such clinical observations were inaccurate and unreliable. The pathologic findings bore no relationship to the supposed clinical data upon which they were supposed to depend. Efforts are being made to base the subject of bone tuberculosis upon a definite fundamental principle upon the assumption that it should be considered as such only in what was formerly

\* Read before Lehigh Valley Medical Society.

known as the incipency and that all subsequent conditions should be looked upon as avoidable sequels. In this manner more and more attention has been devoted to the elaborate study of the first symptoms of bone tuberculosis, thereby tending to avoid the occurrence of the subsequent conditions. While it must be granted that many of the former conditions resulting from bone tuberculosis still exist, this cannot be accepted in any way as disproving the necessity for studying the disease in the incipency.

It must rather be taken as evidence that for some reason the incipient stage was overlooked or not recognized. Definite knowledge now exists, the proof of which has many times been confirmed, that tuberculosis of bones when once started can proceed in one of three definite ways. Postoperative and postmortem findings have many times shown minute cavities in the cancellous structure at the ends of the long bones sometimes filled with a gelatinous material entirely walled in, thereby preventing extension of the affection. Again, many of these little spots that were formerly cavities have been completely filled in with new bone growth presenting the appearance of a white, hard mass in the cancellous structure of the bone. These little spots were undoubtedly the site of the original bone tuberculosis and, under the favorable circumstances that must have existed, have gone on to the healthy action of repair by the process that we know as walling-in and subsequently have become consolidated. This pathologic condition has undoubtedly given rise to the symptoms which are now recognized as the symptoms of the incipency of bone tuberculosis, the intermittent lapse of function, the muscular rigidity, the guarded gait, the night cries, the slight elevation of temperature that are now matters of common observation. Instead of proceeding in this manner toward healthy resolution, the original bone tuberculosis may proceed still further, breaking down the surrounding bone cells, increasing the cavity in the line of least resistance; this may eventuate in breaking through the periosteum outside of a joint,

there forming a tuberculous abscess, or it may proceed toward a neighboring joint, breaking through the articular surfaces and enter the joint cavity. When the latter occurs, there is sure to follow a tuberculous synovitis or, as it is sometimes termed, a tuberculous arthritis giving rise to all the symptoms which are recognized as being present when a joint is affected. Definite proof now exists that a tuberculous synovitis is invariably secondary and never a primary process, that although it may not be possible to trace it clinically, pathologic findings definitely determined that it has been dependent upon a tuberculous osteitis. Not infrequently, the joint involvement is the first symptoms to which attention is called. Careful inquiry will almost invariably elicit the history of guarded gait dependent upon muscular fixation, etc., which has been in existence for a greater or lesser time before the symptoms of the joint involvement became conspicuous; recognizing, therefore, that bone tuberculosis is undoubtedly the basis of all bone and joint tuberculosis no matter how manifested. Changes that have occurred in the manner of treatment have been most marked. Even at the present time, many of the affections are regarded as local manifestation of a constitutional dyscrasia and by others as being a strictly localized disease. Those who looked upon the condition as being distinctly localized advocated methods of removal by surgical methods. At one time, all tuberculous diseases of the bones were subjected to excisions in order to remove the disease. Pro contra, those who looked upon bone tuberculosis as being a constitutional disease resorted to ultraconservative methods avoiding the surgical interference and resorting to all manner of methods of fixation. Prolonged rest of the affected part and of the entire body was sought in fixation in bed with extension applied in various forms. Methods were resorted to, to distend the joints while the patient was carefully maintained in bed. The surgical principle was that a part being in a state of inflammation should be subjected to entire freedom from the trauma of function and in no way could this be better obtained than by keep-

ing the patient fixed in bed. Not infrequently the patient was kept in bed for many, many months, that the slow process of healing, which is characteristic of bone tuberculosis, might go on during the period of avoidance of trauma. It was not an unusual sight to see patients generally lose appetite, refuse food and nourishment of all forms, gradually lose strength and assume a white, waxy color. The subsequent stages would go on with greater or less rapidity. The soft structures of the body would become involved, the necessary organs of respiration and of digestion and of elimination would assume forms of tuberculosis. Amyloid degeneration would become manifest and dissolution by emaciation would be the end. In order to avoid the very serious disadvantages of bed treatment, various forms of ambulatory apparatus were resorted to so that the affected joint could be restrained from functional trauma and at the same time the patient could be getting the advantages of activity of the rest of the body. A great deal of time and attention was given to the subject of mechanical support and fixation, immobilization of the affected joint permitting the rest of the body to be free.

Bier,<sup>2</sup> of Leipsic, directed attention to the method of treatment which he termed the hyperemic treatment of bone tuberculosis. First the dissertation directed attention to the definite pathologic knowledge that the tubercle bacillus could only thrive when there was a condition of sluggish circulation, or capillary stasis, and that in order to remove this stasis passive venous congestion was necessary. This could be accomplished in the method that he described: The method of restricting all venous return of the blood while leaving the arterial circulation unrestricted produced an active congestion of the extremities beyond the restriction, which resulted in a capillary engorgement and distention of the walls of the capillaries. The elastic constriction permits the passage of venous blood when the veins become engorged. The sudden emptying of the veins permits resumption of the arterial pressure and quantities of fresh blood rapidly course through the dilated capillaries, thus accomplishing a

cleansing effect by carrying all the detritus away and at the same time supplying the parts with fresh blood. This operation of congestion as opposed to stasis is repeated from time to time as the peculiar requirements of the individual case demand. This certainly has a sound pathologic basis in that it applies to the site of the disease a method directly opposed to the condition of stasis which was known to be present as an essential factor in the progress of bone tuberculosis. The difficulties of the Bier method are that its application must necessarily be confined very largely to the extremities, the knees, the ankles, the elbows and wrists, whereas the other joints, the hips, spine and shoulders, could not be subjected to the method as applied to the other joints. Therefore, Bier had recourse to modified methods adapted to the spine, hips and shoulders. By means of cabinets which embrace the affected part, efforts were made to obtain the good effect of congestion and hyperemia by softening the surrounding parts so that the capillaries could distend. Acceptation of the definite proof that hyperemia as opposed to stasis was essential for the healthy progress of the case has been accepted by very many writers who have adopted the principles but have modified the methods of application. Adolph Lorenz<sup>3</sup> has advocated the fixation of the affected parts and usefulness thereof as far as the limitation of motion would permit. He terms this "the functional ankylosis method." He aims to secure restriction of the affected part so as to secure ultimate ankylosis where the joint is destroyed by the process of bone tuberculosis. Instead of keeping the affected part free from the use in locomotion, he urges use so as to obtain the circulatory advantages of the Bier congestive method thereby securing it in the more natural way. His plan of treatment is based upon a well-recognized fact, that under the most favorable circumstances a patient with bone tuberculosis will go on toward repair and that repair will be an ankylosis of the part affected. Unfortunately, such an ankylosis usually takes place with the affected limb in a more or less seriously deformed posture necessitating subsequent cor-

rection. Lorenz aims to secure ankylosis in the most favorable position for subsequent use when repair has taken place. His method has for its object the improvement of the general health of the patient which can only be obtained through increased activity, nourishment, and outdoor life as opposed to the methods of confinement formerly in vogue. Quite recently attention has been directed to the cure of bone tuberculosis without restraint of parts or fixation appliances of any kind. Reliance has been placed upon the beneficial effects of outdoor life, hygienic surroundings and good nourishing, carefully regulated diet. The rapidity with which these patients are said to return to health is used as evidence that any form of restraining apparatus is disadvantageous in that it limits the normal movements and thereby tends to a stasis rather than healthy repair. The methods advocated have been so recently announced that the final outcome, the end-results, have not been observed and therefore cannot be reviewed. The rational adoption of outdoor life in connection with restraint of the affected parts, has been considered at length in a recent paper.<sup>4</sup> At one time a great deal of attention was given to the injection of tuberculin either as a test to determine the presence of tuberculosis or for its therapeutic effects. It would seem at this time as though the method had not yet been given sufficiently clear data to prove its value or its necessity. Recently the subject of vaccination or inoculation has been brought before the medical profession in the form of a dissertation upon the opsonic index.

A great deal of elaborate research has been done by Sir Wright to prove definitely the possibilities of serum therapy as applied to bone tuberculosis. The research work has been accompanied by elaborate tables that show the interpretation of blood analysis before and after the use of his method of vaccination. So far as the treatment of bone tuberculosis at least is concerned, the use of inoculations as advocated by Wright and Douglas is not yet beyond the stage where it must be regarded as *sub judice*. By means of inoculations of a

small quantity of an emulsion of dead tubercle bacilli (1 tuberculin R.), it is sought to increase the susceptibility of the microorganisms to the phagocytic properties of the leukocytes by increasing the opsonic power of the blood-serum as determined by the opsonic index. The proper case, of course, varies with the individual and is to be determined only by carefully observing whether or not the opsonic power of the serum is increased (positive phase) or decreased (negative phase). The method depends for its efficacy upon increasing the natural resisting power of the blood. Unless the case is carefully regulated and its effect observed harm rather than good will certainly result. Theoretically the method seems worthy of trial in the hands of those properly trained in the method, but so far sufficient trial has not been made upon which to base an opinion of its practical value. The result of all the various methods of treatment during the past 25 years has been to draw the attention to the necessary feature of prophylaxis, to study more critically and carefully the symptoms and signs that manifest the onset of the beginning stage of bone tuberculosis so that it may be arrested in the very incipency and the subsequent serious deformities prevented. The accomplishment of this very much to be desired object can only be accomplished by directing very careful attention to the apparently trivial signs of the onset. These trivial symptoms and signs so often looked upon as growing pains, rheumatic pains, etc., are capable of recognition if sufficient care is directed to the subject. With a definite recognition of the seriousness of delay or neglect, a great deal of time can well be spent in a careful analysis of the symptoms at a time when recognition is essential. If the disease can be recognized and arrested prior to the time when the tuberculosis has extended outside of the narrow limits of the initial field of invasion no ultimate bone or joint deformity need be feared as a result from the disease. More than enough cases have been reported to prove clearly that perfect normal function can be and should be obtained in the majority of cases of bone tuberculosis.

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- <sup>4</sup>Out-door Life Versus Confinement, H. Augustus Wilson, Penna. Med. Jour., Jan., 1906.

## WHAT HEALTH DEPARTMENTS CAN DO TO SECURE PURE MILK BY INSPECTION OF DAIRIES AND FARMS.<sup>1</sup>

BY

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The problem for a pure milk supply for a city is solved when the Department of Health can guarantee that all milk sold within the city limits is drawn from perfectly healthy and normal cows, housed in comfortable and sanitary quarters, milked by a clean and healthy person into a sterile container, quickly cooled, transported and delivered to the consumer in a sealed package.

As the major portion of such a guarantee concerns the health of the cow and the milker, and the sanitary condition of the stable and utensils, the proper place to begin corrective work is at the source, "the dairy farm."

From the time when each family kept its own cow or depended for its supply of milk on a local farmer, to the present period, when the big cities depend upon a supply drawn from thousands of dairies scattered over wide areas, is a far cry. This change has come about so insidiously, and cities have grown with such astonishing rapidity that it is only recently that the public has awakened to the importance of this vital problem.

The milk supply of New York City consists of 1,750,000 quarts of milk daily which is gathered from over 35,000 farms and shipped from about 700 creameries, located in six different States.

This great quantity of milk is produced in

<sup>1</sup>Read at the meeting of the Health Officers of the State of New York at Buffalo, October 18, 1907.

various sections with a corresponding variety of methods of production. The fact that the farms lay in six States precludes the possibility of uniform supervision by the various local governments.

It is, of course, understood that the Department of Health has no authority outside of the geographic limits of the city, but our sanitary code provides that "No milk shall be received, held, kept, offered for sale or delivered in the city of New York without a permit from the Board of Health," and the Board can withhold or rescind this permit if unsanitary conditions exist at the dairy or creamery where the milk is produced or handled.

New York City has, therefore, the right to say what pure milk shall be, and to forbid entrance to the city, of any milk not produced with the proper attention to cleanliness, hygiene, and sanitation.

It has been the endeavor of the Department of Health to establish and maintain these conditions as regards the milk supply of New York City, first by systematic and constant inspection and second by preventing the sale of any milk not produced under clean and wholesome conditions.

Rules and regulations for the production of sanitary milk were issued, and the Country Division of Milk Inspection, consisting of 16 inspectors with one inspector in charge, is now in the second year of its work of dairy inspection.

For two years prior to this, two experienced inspectors investigated the conditions surrounding the production of our city's milk, and brought to light the vast number of abuses that prevented a clean and unpolluted supply. They made preliminary inspections in various creameries, skimming stations and cheese factories that sent their entire or surplus milk or cream to New York. With the establishment of our present Dairy Division, rules and regulations were sent to every dairyman supplying New York, systematic inspection was inaugurated and the work steadily advancing, has increased in effectiveness and importance.

A majority of our city milk dealers now incorporate our rules and regulations in the contract they make with the farmers for their milk. Tenants on farms now discuss with the owner before renting, what must be done to keep the premises in a sanitary condition, satisfactory to the Department of Health.

During the early part of this work, many extremely unsanitary conditions were found. The situation in some instances was beyond hope of correction. A few dairies were closed as the improvements recommended amounted practically to an entire rebuilding of the dairy. No amount of pasteurization could ever make milk produced amid such surroundings fit for human consumption. In fact, pasteurization cannot atone for filth. Preventive measures are better than corrective ones, and whatever opinion may be held as to the relative necessity of pasteurization, the essential feature of a pure milk supply is that the milk be produced under clean conditions, and that it be kept clean.

The fact that the farmers are without a market for their milk unless they comply with the rules of the Department has been a potent factor in causing them to comply with our orders. The creameries are practically all conforming to our regulations and the dairies and farms are being rapidly put into a sanitary condition.

You have heard considerable of the hardships we are thrusting on the farmer, you have heard of the small producers we are driving out of business, but you will be surprised to learn that out of 35,000 dairies, we have been forced to shut out milk from only 47 places and from these for only a short period, or until they had changed or improved the condition of their premises.

Our requirements can be summed up in one word, "cleanliness," to comply with which is not necessarily impossible or expensive. Our rules concerning the cows provide that they must be kept clean and that the manure must not be permitted to collect upon the tail, sides, udder, and belly. These rules to the clean dairyman would be recognized as

essential, but to the filthy dairyman an impossibility and a hardship.

The rules for stables provide that they must have sufficient light and ventilation; floors, walls and ceilings must be clean and tight, the interior whitewashed yearly, and all manure must be removed daily. In the light of investigations these are necessary to the production of clean milk and can be provided at nominal cost. The removal and immediate utilization of the manure alone, would help pay the cost of these changes, and no longer will the huge piles of manure be allowed to accumulate, a menace to good milk and a direct loss to the farmer in the wasted fertilization of the cow yard.

We insist that the water-supply must be pure. No dairyman should be allowed to use a supply that is otherwise. Our inspectors have sent in thousands of water samples. The analysis and condemnation of impure supplies have been a lasting benefit to the dairyman in our milk shed and to the milk supply in general.

Our rules provide for a milk house to be used exclusively for the handling and storage of milk. This discourages the old practice of straining and keeping the milk in the cow barn where formerly it received its full share of odors, dust and dirt.

Our rules provide that no person having any communicable disease or caring for persons having such disease, be allowed to handle the milk or milk utensils, and the hands of the milkers must be carefully washed immediately before milking. How idle to discuss these as hardships when the most elementary knowledge on the part of the dairyman should alone prompt these precautions.

Utensils must be thoroughly cleaned immediately after using, and the rinsing of the milk pails in the watering trough will neither suffice nor be tolerated.

Our rules concerning milk, provide that it must be free from preservatives and adulterations, it must be quickly cooled to 50° F., and must not be drawn from diseased cows.

The matter of testing every herd within the

State is primarily a State function. The State should establish a quarantine and prohibit infected cattle from coming into the State; it should test every cow within its borders, should condemn and destroy all diseased cattle and reimburse the owner.

A copy of our dairy rules printed on linen, is posted in over 30,000 cow barns in our milk shed. These rules are encouraging a uniform production and are making filthy and unclean methods the exception. With the dairy rules posted, the next step is to see that they are enforced.

Our 16 inspectors are each assigned to a district through which they move in a systematic way. They first inspect a creamery and ascertain its sanitary condition; they then inspect all dairies drawing to that station before passing to the next. Each inspection is complete in itself and all of the information obtained is tabulated on cards and mailed to the office in New York. The inspectors average ten inspections a day and with our present force, we cover the entire milk shed once a year.

To qualify men for this work, was admittedly a hard task. Dairy inspectors must have a liking for the problem of the farm and must be qualified to give helping suggestions to the dairyman when necessary. A civil service examination excludes those without technical or practical knowledge of the work, then by a course of instruction by experienced inspectors, we have secured a corps of men whose qualifications and judgment fit them for their duties.

One peculiarity of our problem is worth mentioning at this time. Heretofore dairy inspection work was performed largely for the purpose of information and scoring was done in a general way. The Department of Health of the city of New York in its new work, had the specific duty confronting it of stating plainly to the dairyman, what sanitary defects were found, and to outline plainly to him what improvements were essential to render his scoring perfect and his premises sanitary.

To that end we adopted our present score

card, with its definite statements, its 75 distinct items and its minute and careful scoring. When these reports are sent in, we prepare a letter which we send direct to the farmer, stating what his dairy scores and what improvements are recommended by the inspection.

The effectiveness of this system of dairy inspection is now being proved. Where re-inspections have been made we have found uniform improvement. Whitewashing has invariably been done. Window lights and additional ventilation have been installed, milk houses built, huge piles of manure carted away and the cows groomed and properly cared for. We have caused thousands of privies to be removed to a greater distance from the well, for the habit of farmers to install these two as dangerous neighbors is well known.

Our new requirement that all cases of infectious disease occurring in the households of the dairyman or his help, must be reported to us at once, has had an educational effect upon the farmer and has made him realize how he can help prevent the spread of milk-borne diseases.

Early in this year, an important addition was made to the Sanitary Code of the Board of Health. It provides that:

"It shall be the duty of all persons having in their possession bottles, cans, or other receptacles containing milk or cream, which are used in the transportation and delivery of milk or cream, to clean or cause to be cleaned immediately upon emptying, and no person shall use or cause or allow to be used any such receptacle for any purpose whatsoever other than the holding of milk or cream, or receive or have in his possession any such receptacle so used or which is unclean or in which milk or cream has been allowed to stand until offensive."

This section is simply in line with our constant efforts toward ultimate perfection.

The cooperation of the State concerning the cleaning of utensils in which milk is shipped, is encouraging. Our inspectors have witnessed upon a farm from which the milk is shipped direct, cans returned in such a condition that the farmer and his wife at first sight would

flatly refuse to clean them. Sooner or later those cans would be used and as the means of thoroughly cleaning them on the farm is limited, we can imagine the condition in which they were refilled and shipped back to the city.

Probably the last and best word that has been said on the subject of the control of the milk supply is that embodied in the report of the commission appointed by his Honor George B. McClellan, Mayor of New York City, to study and report on the best methods of milk inspection and control. Several of their conclusions are as follows:

1. That milk obtained from a healthy cow is always wholesome, and never a source of danger if it is kept cool and uncontaminated.

2. In regard to tuberculosis, the report states that the risk of transmitting tuberculosis through milk from cows to man is very slight, unless the disease in the cow is in an advanced form, or is present in the udder. Then this slight risk is considerably lessened when such milk is mixed, as it generally is, with that of healthy cows before it is sold. We believe that this danger has been greatly overestimated in the public mind, and that it can best be met by systematic inspection and condemnation of cows revealing tuberculosis on physical examination.

3. To secure a good milk supply it is of the first importance to educate the farmers regarding the measures which alone make this result possible, and afterwards to see that the rules relating thereto are carried out, since for the most part the contaminating agents which render milk dangerous are introduced at the farms. The production of good milk demands that the farmers be educated so as to secure this result, and also that the proper surveillance be exercised.

Since the system of inspection has been in force, the milk supply in New York City has been materially improved. Granting the premise that I have taken that the function and responsibility of a municipality can be only to furnish to the citizens a supply of pure milk, then the question is simply one of expansion

and possibly elaboration of detail. The main and fundamental facts are perfectly clear. Systematic inspection is an absolute necessity, and the maintenance of absolute cleanliness is a *sine qua non*.

## STASIS HYPEREMIA OR THE BIER TREATMENT OF ACUTE INFLAMMATIONS AND SEPTIC WOUNDS OF THE EXTREMITIES.\*

BY

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As a recent writer has said, "In medicine we must be alert, indeed, if we would keep our mental picture in harmony with the array of new facts which modern research is bringing to light." For this reason I have thought it would not prove unprofitable to consider the treatment of certain abnormal conditions by means of stasis hyperemia. This method of physical therapy bears the name of a well-known surgeon and is generally called after him "the Bier treatment." Numerous theories have been formulated in explanation of the favorable results obtained from use of this method. It is claimed that in septic wounds, necrotic tissue is thrown off, resolution promoted and the danger of the spreading of the infection lessened. In many cases, as will be shown later, the Bier treatment lessens or prevents the impairment of function, as well as restores function to damaged organs and joints. Of the part played by the phagocytes, I will speak later. In the recent literature, several writers have expressed the opinion that the Bier treatment does away with the necessity of making incisions in infected conditions. My experience has led me to agree with E. Lexer,<sup>1</sup> who considers that in mild cases of acute infections the treatment may be used. In severe infections he believes the treatment is injurious unless free incisions have been made. The deeper the inflammatory region the less ample

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is Bier's treatment. The treatment has its distinct limitations and these are apparently beginning to be defined.

The class of cases in which I have used Bier treatment, include infected suppurating wounds of the extremities, ankylosed joints, rheumatic arthritis, etc. In suppurating wounds, the pus should be evacuated freely. Some skill should be exercised in making the incision in order not to injure or split the tendons. My way of evacuating pus is to make the incision of the desired length only through the skin, then push in a pair of closed dressing forceps and pull the blades apart. This causes no injury to bloodvessels, nerves or tendons, neither does it remove the inflammatory wall already formed but simply allows the pus to escape.

I have been interested to learn what changes take place in the blood in stasis hyperemia. Regarding the opsonic theory, or the formation in the blood-serum of an ingredient, which aids phagocytosis by its inhibiting action on a given microorganism, I am not competent to speak, as I have made no observations along this line, though Stahr<sup>2</sup> and others state that no factor could be demonstrated in the blood-serum. In four cases in which I have made careful observations on the formed elements, I have found in each case a very decided difference in the number of leukocytes present in the part before the bandage was applied and after it had been applied for an hour. The leukocytes in those cases in which the bandage was applied for half an hour or longer, showed a marked increase in number. This increase particularly affected the lymphocytes, which at times were nearly doubled in number after application of bandage. There was a decrease in the polymorphonuclear leukocytes. There was also a marked increase in the hemoglobin as shown by Fleischl's hemometer. I was particularly careful on this point as my observations do not agree with those of Stahr. In every case I had my assistant verify my observations: Case I showing 69 before and 87 after use of bandage, Case II showing 86 before and 110 after, and in

Case III, 65 before and 95 after. In two other cases the difference was just as marked. In one case the count before application of the bandage showed polymorphonuclears as 40 to lymphocytes 17, after bandage polymorphonuclears as 10 to lymphocytes 54. The number of erythrocytes remained entirely unchanged. Stahr<sup>3</sup> accounts for the leukocytosis by assuming that the blood current was slowed, or that there was an increased chemotaxis or an increased activity in the formation of the blood. This local leukocytosis probably accounts for the increased phagocytosis, and this is, of course, of import in the curative process.

CASE I.—W. D., sent down from Rockland. Two weeks before entering the hospital he injured his little finger. In a few days this became very painful and swollen and was opened one week later by a local physician. When admitted to the hospital, the patient was suffering from a badly infected wound of the hand. The whole hand was swollen, red and painful, the cellular tissue being inflamed; a condition designated by Birlorth as panaritium. The inflammatory process also extended much deeper, the sheaths of the tendons were affected; pus had burrowed under the palmar fascia across the hand. Several openings were made and pus drained out, the hand and arm soaked continually in hot mercuric solution, 1 to 5,000. The patient's temperature was high, reaching 40° C. On the whole he was a pretty sick man. In spite of the free evacuation of the pus, the infection extended and in a few days he had phlegmon of the forearm. Free openings were made in several places, the periosteum had peeled off and the bone was necrosed. However, cases of this form of intense infection are occasionally met by all of us and are of no special interest so far as this paper is concerned. I did not use the Bier treatment in the beginning for I do not regard it as proper treatment for deepseated infections. Later, however, when the pus had disappeared, as the tendons were bound down and matted together, the scar tissue from the incisions retracting, the muscles atrophied, the hand almost useless on account of inability either to flex or extend the fingers, I thought it time to give it a fair trial, especially as mechanico-therapy in connection with massage and use of hot air apparatus (temperature 300° to 350°) and electricity had failed to do any good so

far as restoring the functions of hand were concerned. Ether was administered and the adhesions broken up so far as possible, but even then the fingers could only be flexed to about  $20^{\circ}$ . After this the man could flex his fingers himself to a slight extent, say about  $10^{\circ}$ , with the exception of the thumb and little finger, the latter being drawn by contraction of the tendons and formation of fibrous bands. Sensation in the fingers was almost entirely abolished.

The Bier treatment was begun a few days after the attempt to break up the adhesions. From this time I will give notes as taken daily.

Method of applying bandage: An ordinary three-inch rubber bandage, four feet long with two tapes fixed on out end to tie it by, is placed around the forearm just below the elbow, the bandage is drawn sufficiently tight to almost stop circulation, it is then loosened until the radial artery shows fair circulation, then tied and left for one-half hour. The arm and hand become bluish-black in color and very edematous.

December 5, 1906: Bier treatment begun; rubber bandage applied to arm just below elbow; kept on for 30 minutes; forearm and hand became greatly congested and edematous. December 6: Fingers can be moved somewhat better this morning; bandage again applied for 30 minutes. December 7: Fingers seem to improve under this treatment; patient much encouraged; told to rub and bend fingers as much as possible with sound hand. I massage them myself for a few minutes at each morning visit. Notes on December 9, 10, and 11 are the same, only the bandage is left on 40 minutes. December 12: Bier treatment giving good results; forearm much improved. Patient is almost able to close fingers; thumb, only one joint movable. After this the bandage was left on for an hour each time. January 9, 1907: The adhesions are constantly breaking up; patient improving greatly; can move all of his fingers freely (little finger excepted); has good movement in both joints of the thumb; the grip of the fingers is still very weak. January 24: Patient has use of fingers and thumb, can grip with some force, can raise a weight of about 40 pounds from the floor for a short distance. Sensation is fairly good; there is some trophic disturbance as shown by a small ulcer that has appeared on the inner aspect of the index finger and refuses to heal. February 15: Man has very useful forearm and hand; not entirely restored, but a great deal better than I

expected to see it. Today he called my attention to the fact that the small superficial veins of the arm and hand were reappearing for the first time, also that the cicatrices were loose and disappearing, and that all muscles moved easily.

This case has been a great satisfaction; the man is young and has to make a living which he now can do with both hands. In another case both hands were badly frost bitten. The patient had suffered a disabling lesion of the hand, some time previous to the injury produced by cold, and this had much to do with contraction of tendons, etc. The skin lesions healed nicely but the fingers of both hands were stiff. This case is mainly of interest as affording an opportunity of trying two methods under suitable conditions on the same man. On the right hand the stasis hyperemia, produced by means of a rubber bandage, kept on for half an hour, was tried; on the left hand, dry heat carried to  $350^{\circ}$  by means of a Bett's hot air apparatus, was used. The Morton current was also used occasionally on both hands. The patient claimed to get great relief from both methods. The results were good in both hands. The man nearly recovered complete use of both hands; he stated that they were better than they had been since first injured. I think the result was better in the right hand, or the one on which the high degree of heat was used, but a hot air apparatus cannot be carried around and is not always available, whereas a two-inch rubber bandage can be had even at a distance from medical centers.

In gonorrheal arthritis I expected nothing from Bier's method of producing temporary hyperemia with local edema of the joint, hence I was agreeably surprised to find that it gave great relief in the six cases in which I used it. In one case in particular, the relief from pain was so rapid and permanent, and the functions of the joint so quickly restored that I was half inclined to believe the man had been malingering. In others cases the results, while not so marked, were quite good, better than from anything else.

CASE II.—This patient has been suffering

greatly for a month; he has been confined to bed; the trouble began as influenza. Later his knees, ankles, and wrist-joints became swollen, he also complained of great pain in the chest; pain was so constant as to prevent sleep. Patient also suffered very badly from night sweats. The main treatment was, of course, proper internal medication. In addition to this, a high degree of heat was used on joints, also prescription consisting of

Salicylic Acid.....20.  
Castor oil.....40.  
Alcohol.....40.  
Mix.

was applied to the joints on cotton wool and covered with oiled silk. I have usually had very satisfactory results from this treatment, but in this case the symptoms would not yield. After about three weeks of this treatment, I decided to try the Bier treatment; applied bandage to right knee and left wrist; left on for one hour; the relief was remarkable as was the improvement in the condition of joints, as several joints were affected at the same time. I tried high degrees of heat on some and Bier treatment on others. The joint lesions yielded much more rapidly to the latter; the patient says the bandage lessens the pain much quicker than the heat; he can also use the joint quite freely after the use of the bandage. Four days after beginning of treatment the swelling and pain have disappeared; the functions of the joints are restored; the temperature is normal and the patient able to sit in an easy chair.

CASE III.—Gonorrheal rheumatism: Both knees swollen and painful. Began use of bandages on March 14. On March 18, the swelling was greatly reduced, there was no pain, patient could move joints freely; wanted to get out of bed. On March 21, seven days after the beginning of treatment, the patient was able to walk about the ward.

CASE IV.—Gonorrheal rheumatism; Joints swollen and painful; temperature 38.5°. Bier treatment by means of a rubber bandage applied to knee and wrist for one-fourth to three-fourth hour daily. In six days the relief was complete, no pain or swelling; joints flexible; patient can walk a little about the ward. Temperature normal.

Hirsch<sup>4</sup> has reported cures in 25 cases, but the experience of Robin<sup>5</sup> in only two cases was not sufficiently favorable to lead him to recommend it.

Hoppe<sup>6</sup> states that he considers Bier's congestion method to be as useful in the treatment

of certain affections in the neighborhood of the eye, as it has been found in the management of inflammatory conditions of other parts of the body. He first describes experiments on the healthy eye, which have convinced him that the treatment, when properly carried out, cannot in any way injure the eyeball itself, while it is also probable that disorders of the globe can be very little influenced in this way. The most satisfactory results were obtained in cases of hordeolum. The author believes that the hyperemia treatment alone, carried out by means of suitable suction glasses at a negative pressure not greatly exceeding 30 mm. of mercury, forms the most efficient therapeutic procedure in these cases.

Among the advantages are the prompt and permanent relief of pain, the avoidance of troublesome dressings and the fact that the patients are able to continue at work. Furuncle of the eyebrow also yields readily to this method, but the results in Chalazion were somewhat less satisfactory and the author advises that incision be resorted to, if prompt improvement does not follow the suction treatment.

Lindenstien<sup>7</sup> reports the results obtained from the use of Bier's stasis in a large number of cases of such widely differing conditions as furuncles, carbuncles, felons, infected wounds, lymphangitis, phlegmons, purulent tenosynovitis, purulent synovitis of joints, postpuerperal mastitis, inflammation of the gums, otitis media, as a means to advance the union of fractured bones, tuberculosis, joint disease and gonorrheal arthritis. The results were good rather than brilliant, but in many of the cases the writer received the impression that the favorable outcome was due to the employment of this means.

Hartman<sup>8</sup> reports in detail the histories of 12 cases of mastitis in which the Bier treatment was applied. He is of the opinion that it is very beneficial and an advance in treatment. Pain and fever are lessened and early cases are aborted in from three to five days without incision. Hartman thinks that the three commonest errors in the use of the

suction treatment are the application of bells that are too small, the omission of early incision, and discontinuing the suction too soon. He thinks that in treating mastitis by this method the diameter of the bell should never be less than 10 cm. and frequently one with a diameter of 15 cm. may be required. If there is fluctuation, a small incision under local anesthesia should be made. Daily treatment is recommended, suction is applied four or five times during a space of five minutes with an interval of from three to five minutes. Between applications of the instrument at the close of each session milk is drawn from the affected glands by means of a small bell placed over the nipple and a wet dressing of aluminum acetate is applied.

In subacute indurated forms of mastitis the passive hyperemia produced by the suction treatment is not so satisfactory; wet dressings followed later by massage is in many cases better. The cosmetic and functional results obtained by the Bier treatment are excellent and better than those obtained by any of the older forms of treatment.

Stenger<sup>9</sup> states that the opinions of otologists in regard to the value of Bier's treatment by hyperemia in suppurative ear diseases are not entirely in accord. Some writers express views rather adverse to the method, while others esteem it highly. He reports the results he himself obtained in 18 cases of acute suppurative conditions and states that he believes the method will be found of distinct value in otology. He employed two methods of producing congestion. First, by means of a rubber neck bandage, second, by use of suction cups. In suppurative otitis media he believes the treatment may be begun as soon as the severity of the symptoms are modified by ordinary treatment. If alarming symptoms develop, the congestion treatment should be employed at once in connection with other measures. In cases of involvement of the mastoid, Stenger makes the skin incision and evacuates any pus that may be under the periosteum and chisels a narrow passage to the antrum. A suction cup is then

applied to the wound and allowed to remain for several hours. Large amounts of secretions are usually obtained and the procedure is repeated every few days for a shorter time. In cases without abscesses, but in which there is swelling and tenderness over the mastoid, a small incision is made and an opening effected in the bone, though this may not penetrate the antrum. The mastoid cells can be drained of any secretion by the application of suction cups.

Colley<sup>10</sup> is warm in his praise of the method. By bringing bacteria of known virulency into contact with edema fluid taken from a congested limb, the seat of a suppurative process, he was able to prove that a distinct bactericidal action, not present in serum from a normal limb, was developed in the body fluid of a region subjected to the congestion treatment. Colley speaks highly of the value of the method in such conditions as mastitis, buboes, and furuncles. He disapproves of the application of general congestion to the head by means of the neck bandage, owing to the intercranial hyperemia that must be produced. He has also found that warm baths, after the removal of the congesting bandage or suction cup, have a beneficial effect. He claims to have had striking results in eczema by the congestion treatment.

From the reports of cases of anthrax and poisoned wounds of the extremities treated by use of congestive hyperemia, we see that the method in use of placing a constricting bandage around a limb in cases in which persons have been bitten by a poisonous serpent, rests upon a rational, scientific basis since there is a decided phagocytosis, and the opsonic index is raised, thus increasing the resisting properties of both the solid and fluid constituents of the blood in a high degree. At the same time the constriction on the limb allows, only a small quantity of the venous blood to reach the general circulation at one time and thus it has its virulency modified.

The cupping glass which was largely used at one time over inflamed areas acted on the same principal as the bell used in the Bier

method, the difference being that it was not kept up a sufficient length of time and the difference in the diameter of cups used. Tight strapping of the testicle in epididymitis was on the same general principal, only in this case the constricting bands were left on longer.

It is, therefore, somewhat remarkable that so useful a measure should have fallen into disuse, or rather that it should have so long failed of development. I have already mentioned some of the limitations of this method; in addition it is contraindicated in the following:

Any condition which renders the blood liable to coagulate, that is, changes in the blood itself, in the vessel walls and the speed of the current. Slowing of the current alone will not cause coagulation, otherwise the Bier treatment, which causes marked slowing of the current, could not be used; if the other two predisposing causes are present, stasis hyperemia is dangerous, because of venous thrombosis followed by pulmonary embolism. Patients who have recently suffered from enteric fever, puerperal sepsis, diphtheria, pneumonia or other conditions in which infective septic emboli are liable to form in the blood current, or who are suffering from grave anemia or an altered condition of the blood in which its viscosity is possibly increased, or cases of advanced diabetes, atheroma of the walls of the bloodvessels or in which there is a pathologic condition of the inner coating of the arteries, veins or chambers of the heart are not proper subjects for the use of this treatment.

From personal observations in the use of this method, I am of the opinion that when judiciously used in proper cases it is a procedure of undoubted efficiency. I think the Bier treatment, or stasis hyperemia, has a bright future and will become a fixture as a surgical procedure.

#### REFERENCES.

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- <sup>2</sup>Medical Record, Op. Cit.
- <sup>3</sup>Medical Record, May 19, 1906.
- <sup>4</sup>Revue de Therapeutique, Dec. 15, 1906, quoted from N. Y. Medical Journal, January 12, 1907.

<sup>5</sup>Op. cit.

<sup>6</sup>Deutsche medizinische Wochenschrift, October 4, 1906, quoted in Medical Record, October 27, 1906.

<sup>7</sup>Muenchener medizinische Wochenschrift, September 18, 1906, quoted N. Y. Medical Journal, October 13, 1906.

<sup>8</sup>Muenchener medizinische Wochenschrift, February 5, 1907.

<sup>9</sup>Deutsche medizinische Wochenschrift, February 8, 1906, quoted Medical Record, March 3, 1906.

<sup>10</sup>Muenchener medizinische Wochenschrift, February 6, 1906, Medical Record, Op. cit.

## SOME PERSONAL EXPERIENCES WITH FRONTAL SINUS DISEASE.

BY

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The frontal sinus is perhaps the most important of the accessory cavities of the nose. Its comparatively small size, its nearness to the brain, its tendency to become blocked up by a large middle turbinate, and the severe pain which often accompanies its diseases all combine to bring it to the careful notice of the rhinologist. In no other class of cases is relief from pain so eagerly sought or so willingly admitted.

Statistics taken from many sources seem to indicate that next to antrum disease, the ethmoidal cells or sphenoidal sinuses are diseased oftenest. In reviewing my notes for the past two years, I find that disease of the frontal sinus, catarrhal or purulent, almost equals in frequency disease of the antrum, while the ethmoidal cells and the sphenoidal sinuses follow in the order named.

I am inclined to think that frontal sinusitis is much more frequent than most authorities would have us believe. A careful examination of many cases will yield more or less pain on pressure of the anterior wall or the floor of the cavity, which is very probably due to a catarrhal condition of the mucous membrane. In purulent conditions the pain is, of course, more pronounced.

The headache or neuralgia of frontal sinus

disease is more fixed or localized than in disease of the other cavities. While in antrum affections, there may be no pain or only a feeling of fullness over the cavity, and in ethmoidal and sphenoidal disease pain, severe or slight, may be referred to the temples, the occipital region and to the vault of the head, there are few cases of frontal sinus disease in which the pain is not localized in the supraorbital region. So constant is this that frontal sinusitis is often mistaken for neuralgia of the supraorbital nerve. This apparent diagnosis is confirmed by pressure on the nerve as it emerges from the foramen without careful examination of the walls of the sinus. Treatment of the neuralgia does no good and the patient continues to suffer until the real cause of the pain is discovered and treated. I may say in passing that practically all "grip" neuralgias of the supraorbital nerve are examples of inflammation of the lining membrane of the frontal sinus. The pain may be subjective or objective or both.

In certain cases of asthenopia, unrelieved by treatment of the eyes, with no symptoms referred to the frontal sinuses, pain will be elicited by pressure on the walls of the cavities. In such cases probing the sinuses will sometimes relieve the asthenopia temporarily or permanently.

In examining for pressure pain one must be careful not to make pressure on the supraorbital nerve, since this point is painful in normal heads. The painful points, as I have found them, are the anterior wall, the orbital ridge between the nerve and the internal angle of the eye and the floor of the cavity. It is always well to compare the two sides; in diseased conditions the patient will invariably indicate the side which is affected.

Pain is a symptom of great importance, for it directs our attention to the frontal sinus. The subjective pain is often severe in character—usually it begins in the morning between the hours of 9 and 12 o'clock and lasts three to five hours. The patient is then relieved until the next day when the pain returns at about the same hour. In two of my cases the paroxysm deviated from this rule in recurring

every second day; in the one case beginning at 12 o'clock or between the hours of 12 m. and 4 p. m. and in the other at 11 a. m. Both cases were chronic in character and had lasted many months. Both patients suffered severely during the paroxysms and did not obtain relief until the diseased cavities were opened and cleaned out. We may say that the pain of frontal sinus disease is nearly always localized in the supraorbital region and, as a rule, comes on in the morning to last three to five hours. Exceptionally the paroxysm comes on every second day—in such cases the disease must not be confused with malaria as happened in one of my patients. If the cavity contains pus, the anterior wall is very sensitive on percussion, while pressure always causes more or less pain. If the inflammation is catarrhal, and my experience convinces me that such cases are by no means rare, pain may or may not be referred to the region of the sinus. In such cases the pain is usually not as severe as in the pus cases and the discomfort may be felt in the eyes as asthenopia—inability to use the eyes for any length of time, blurring of the letters, redness of the conjunctiva, etc. I have not observed much difference in the pain of acute and chronic sinusitis—one is about as severe as the other and immediate relief is demanded in each case. I have seen dizziness in only a few cases of chronic sinusitis. In one patient of advanced age with arteriosclerosis this symptom was pronounced and only partially relieved by treatment.

Pus was present in the nose in all the cases except three, two of which were chronic. In one chronic case repeated examinations failed to reveal pus though the cavity was full and the mucous membrane greatly thickened. In all cases opened externally, the impossibility of a cure intranasally was demonstrated in the thickened and granular condition of the mucous membrane. The pus in nearly all cases was thick and ropy as shown by the first washing after the removal of the turbinate. In only a few cases could the mucous membrane of the nose be sufficiently reduced by the application of cocain and an epinephrin preparation

to give fair drainage. Usually the middle turbinate formed a barrier to the introduction of the probe into the sinus and the anterior end had to be removed before treatment could be instituted. In two cases complicated by anterior ethmoiditis, multiple polypi were present. In my experience these growths were not present in uncomplicated cases.

The middle turbinate was nearly always enlarged and had a peculiar, succulent appearance. Except in cases complicated by antrum disease the lateral "*schleimhaut wulst*" was not present. Coakley's claim that practically all patients with chronic frontal sinusitis have anterior ethmoiditis was not confirmed in my series of cases. Only two patients with this complication were seen and, in both, the obstruction caused by polypi was the chief symptom; in one case there was a vague pain in the temple of the affected side and in the other no headache was complained of. Both cases, however, were sensitive to palpation and percussion over the walls of the frontal sinus.

Transillumination was used in most of the cases but was often disappointing in its results. In some cases the opacity of the diseased side was well marked; in others, sinuses, which were proved by other tests to contain pus, presented the same picture as the unaffected side; in all catarrhal cases the test was absolutely negative. In the most important case from a diagnostic standpoint, both sinuses were opaque, due, as was afterwards shown, to abnormal thickness of the bone. We may say that in connection with other symptoms and signs, transillumination is of some value but taken alone is of no value whatever. During the past winter in dissecting two skulls, great differences in the frontal sinuses were found. In the one case, both sinuses were large, extending nearly to the external angles of the orbits with thin anterior walls; in the other case the sinus on the right side was absent while on the left side the cavity was no larger than a bean. It is obvious that in these two cases, the light would have given entirely different results. In the former case translucency would have been marked, while in the latter both sides would have been opaque.

My observations confirm the opinions of other investigators that the light test is of little value in frontal sinus disease.

In one patient there was marked dryness of the nasal mucous membrane of the affected side; I have observed this in antrum disease but never before in disease of the frontal sinus.

In the series of cases, four external operations were performed, all of which were done by the Coakley method. In all these patients the condition of the mucous membrane at the time of operation seemed to preclude the possibility of cure by any intranasal operation. Intranasal treatment had been carefully carried out for a long time but the headaches persisted. In three of the cases, free drainage was certainly established through the nose since pus could be easily washed out; in the fourth case the headaches were temporarily relieved but I was never certain that the canula had entered the sinus. All the external operations healed after a time with a minimum scar. In no case was there depression except at the point where the gauze packing was inserted. The only objection to the operation is the length of time required for healing. In all other respects it is, in my opinion, almost an ideal procedure. I have seen, in European clinics, depressions that were ugly deformities. In three of my cases the scar was scarcely noticeable, while in the fourth a funnel-shaped depression remains which can easily be removed by a plastic operation.

I believe that most cases of frontal sinusitis can be relieved of pain by intranasal treatment and many patients are satisfied with such a result. Quite a number will also be cured of the purulent discharge through such treatment. If the mucous membrane is much thickened, I do not believe it possible to restore it to its normal condition without thorough curetting which cannot be done by any intranasal operation. If the headaches persist after careful and prolonged intranasal treatment, I advise the external operation. I have had no cause to regret such advice. The operation of Ingals would seem to be the ideal intranasal treatment if we could always be sure that our probe

was in the frontal sinus. In a few cases I have been much perplexed to know just where the probe was; in such doubtful cases, I always feel that I have not reached the cavity. My only guarantee of being in the sinus is the assertion of the patient that the probe is felt on the anterior wall of the cavity. My experience with the suction apparatus has been limited. In two cases it seemed to draw pus from the sinus with some relief to the patients. I am inclined to think it will be of more service in antrum disease.

In one case of frontal sinusitis the nervous symptoms were very pronounced but such symptoms as a rule are much more prominent in ethmoiditis. In several cases of chronic disease there was confusion of ideas and inability to concentrate the mind for a long time.

Acute frontal sinusitis is generally easy to cure if treatment is begun at once. In one of my acute cases, the disease refused to yield to intranasal treatment and the sinus finally had to be opened externally. The following cases will illustrate what has been said regarding frontal sinus disease.

M. G., female, contracted a cold, following which she had pain over the left eye, which was worse in the morning but never entirely disappeared. She was treated for supraorbital neuralgia with little or no relief. Examination of the frontal sinus showed slight bulging of the anterior wall and tenderness on pressure. After applying cocain and an epinephrin preparation to the middle turbinate, a tube was passed into the cavity and the same washed out with weak boric acid solution. About two drams of thick, stringy pus came away and the patient experienced great relief. A few washings effected a cure. This was acute frontal sinusitis following a simple coryza.

J. L., male, without any apparent cause suddenly developed pain over both eyes. An exophthalmos of the left eye rapidly appeared. The anterior wall of the left sinus was tender on palpation and percussion. Cocain and an epinephrin preparation shrunk the tissues so that a probe could be passed into the sinus. Pus followed removal of the probe in such quantity that washing was not resorted to. After a few days of treatment the patient was much improved both as to the exophthalmos and the pain. In addition to the marked bulging

of the eye, this patient had an optic neuritis with diminished vision. Treatment cured the affection of the optic nerve as well as the exophthalmos.

It is probable that the anterior ethmoidal cells were diseased and contributed in part to the trouble with the eye. This complication could not be made out so the case is recorded as frontal sinus disease. The condition was certainly acute, as there was no history of a former trouble. This patient was the only one in whom a pathologic lesion of the eyeball was found.

T. M., male, had suffered for some years with periodic attacks of what he thought was neuralgia of the supraorbital nerve. The pain was limited to the right side of the head and was of great intensity. During the attacks the patient was incapable of doing any kind of mental work. Between the attacks his condition was never normal. His brain refused to work properly. Examination of the nose showed a small amount of pus in the region of the middle turbinate, which was enlarged and exerting pressure on the surrounding tissues. The anterior end of the turbinate was removed with difficulty. Two days later, the sinus was washed out and a dram of thick pus removed. The patient has been free from pain since but there is at times a slight discharge of pus. His brain power has improved. This case was probably chronic in character with acute exacerbations.

G. P., male, in February, 1904, had a mild case of "grip." Two weeks after recovery he was seized with pain over the left eye. This pain would begin in the temporal region with a feeling of fullness or tension and pass inward toward the middle line of the forehead, gradually growing more and more intense until it was agonizing in character. The attacks recurred every other day at 12 o'clock or between the hours of 12 and 4 p. m. The duration of the pain was five hours. The patient consulted his family physician, who gave him anodynes with no relief. He was treated for supraorbital neuralgia, neurasthenia, astigmatism, malaria, stomach and liver trouble. By remaining perfectly quiet the day on which the attack was due, the patient could ward off the paroxysm until the third day, but it was sure to come on this day. Ten physicians saw this patient and the last one advised injections of osmic acid and electricity before having the supraorbital nerve cut. The mucous membrane of the affected side was dry. No pus was ever found in the nose, and the patient, who was a very intelligent

man, denied a discharge at any time from the nose or throat. The attacks lasted 11 months and at the height of the paroxysm the patient would be almost insane from pain. The morning before each attack there would be a sense of dizziness and inability to concentrate the mind. Coakley's operation was performed and the sinus found filled with pus and thickened mucous membrane. The headaches immediately disappeared and have never returned. Healing was slow and uneventful. At the end of eight months the cavity was completely closed and a small funnel-shaped depression was left.

This case was the most puzzling of the series. Transillumination showed nothing because the anterior wall of the sinus was at least three-fourths inch thick. The absence of pus with the negative result with the light and the peculiar character of the attacks made the case difficult to diagnose. Tenderness on palpation and percussion, the antecedent infectious disease, the dryness of the mucous membrane and the recurrence of the attacks at regular hours made the diagnosis. Just why the patient did not have daily recurrences of pain I am unable to explain. The sinus was filled with pus which gushed forth under great pressure when the curet entered the cavity, indicating that drainage was poor. Malaria was naturally thought of when the attacks recurred with such regularity every second day. This was by far the most instructive case of the series, and convinced me that disease of the frontal sinus can assume any character as regards pain.

H. K., male, had complained of a dull, constant pain over the right eye and side of the head for some years. His eyes had been examined and he had been treated for various troubles with only partial relief. Early in 1905 he began to have typical frontal sinus pains. The attacks would come on about 9 o'clock in the morning and last until 1 or 2 o'clock in the afternoon. During these attacks the greatest pain was over the supraorbital nerve. He was never entirely free from pain. The anterior end of the middle turbinate was large and pus was found between it and the outer wall of the nose. After removal of the turbinate and repeated washings of the sinus, the headaches improved. The patient had a specific history and wellmarked arteriosclerosis. He begged

for an external operation but for various reasons I declined his request.

Miss S., following "grip," was seized with severe neuralgia over and in the left eye. Two weeks later something "broke" in her head and she experienced great relief. She did not recover her health and was so run down that one physician assured her that she had pulmonary tuberculosis. At times the pain in her head gave her much trouble as did a discharge into the throat. During the summer of 1905 she took cold following which the neuralgia returned with all its former intensity. The middle turbinate was enlarged and painful to the touch. After the removal of the anterior end and washings of the sinus the patient improved. At last accounts she was having some pain. This was undoubtedly a chronic case and the only prospect of a definite cure lies in cleaning out the sinus. This patient was a singer and she complained that her medium notes were never clear, due no doubt to the diseased condition of the sinus.

J. K. came to the Presbyterian hospital in December, 1905, with severe pain in the right eye. He stated that he had such pain before and that it was always so pronounced that he was unable to sleep or work. The floor of the sinus was sensitive to pressure. The middle turbinate was enlarged, so it was thought best to remove its anterior end. A few washings of the sinus brought relief. This was probably a chronic case with acute exacerbations.

Miss A. had suffered with her head for some months. An oculist examined her eyes but found only hyperopia. She was sent to me for nasal examination. The walls of the sinus were sensitive to pressure and transillumination showed opacity of the affected side. Pus was present in the nose. The anterior end of the middle turbinate was removed and an attempt made to wash out the sinus. The patient shrieked with pain and the left eye was seen to bulge. Convinced that there was necrosis of the bone, I advised immediate external operation. The sinus was opened and cleaned out. The mucous membrane was much thickened and careful probing of the bony walls revealed a fistula leading into the orbit. With drainage established, the exophthalmos gradually disappeared and the eye was as good as ever. At the end of seven months the cavity had filled and only a slight scar remains. The sinus was rather large, extending beyond the supraorbital notch.

G. Y. had suffered with violent headaches for some time. At times the suffering was so great that he could not sleep. The pain re-

curred at irregular intervals and precluded the possibility of work. The walls of the sinus were sensitive, the middle turbinate enlarged and pus was found in the nose. Repeated washings had no effect on the pain so external operation was suggested and accepted. The sinus was not found in the usual location. In working carefully downward from the bony cavity, a funnel-shaped opening into the nose was found. The mucous membrane was covered with granulations. The small sinus closed completely in about three months.

G. H. suffered with "weak eyes." He could read with comfort only a few minutes and was seriously considering giving up his college course. The eyes showed a slight myopic astigmatism and the muscles were normal. The walls of the sinuses were somewhat sensitive on pressure. Both middle turbinates were rather large. After the use of cocain and an epinephrin preparation it was possible to introduce a probe into the sinuses. No discharge could be detected and transillumination was negative. Probing gave some relief for several days. The advice to have the turbinates removed was not taken. This was a case of catarrhal sinusitis and could have been relieved by proper treatment of the turbinates.

C. E. had asthenopia with symptoms similar to the foregoing case. She could use her eyes only for a short time. The middle turbinates were enlarged. Probing gave great relief but the suggestion to have the turbinates removed was not taken. The light was negative in this case. The patient could have been relieved by proper treatment.

Mr. W., following an attack of "grip," had great pain over the left eye. He took anodynes with no relief and finally consulted an oculist who diagnosed frontal sinusitis and referred him to me. The walls of the sinus were sensitive, pus was present in the nose and the middle turbinate was enlarged. The light showed some opacity. The middle turbinate was removed at the first sitting—there was a gush of pus and relief, almost immediate, was the result. This was acute frontal sinusitis.

E. S., without apparent cause, was seized suddenly with pain over the left eye. The walls of the sinus were sensitive on pressure and the light showed opacity. Pus was seen in the nose. The middle turbinate, not much enlarged, was removed and the cavity washed out. The headaches improved for a time and then returned. After prolonged treatment through the nose, Coakley's operation was done. The sinus was filled with pus and the membrane

greatly thickened. The headaches were cured. The wound healed in about four months with little deformity.

Miss E. U. was a sufferer from headaches which began over the left eye and became gradually diffused over the head. The pain came on about 11 o'clock every second day and lasted for several hours. So intense was the pain that she was forced to go to bed and remain there until the attack had passed off. The light was negative, both sinuses giving the same reflex. The anterior end of the turbinate was removed and a probe passed into the frontal sinus. Its removal was followed by thick pus. The anterior ethmoidal cells were also diseased and were cureted with only slight relief. The frontal sinus was then opened by Dr. Frank Martin who found a gelatinous mass anteriorly and some pus posteriorly. The operation was recently done and the result cannot yet be determined.

Mr. R. had a slight attack of "grip" which was followed by pain, severe in character, over the left eye. The pain began in the morning at 11 o'clock and lasted until 12 o'clock midnight. The walls of the sinus were exquisitely tender, while percussion over the painful area caused great suffering. Pus was present in the nose. The turbinate which was almost normal in size was pushed over by a deviated septum and interfered with drainage. Its removal was followed by some relief and washing out the cavity practically cured the headaches. In this case the pain was agonizing in character and large doses of morphin were required to give the patient any relief.

Mrs. G. W. for some years had been very nervous and depressed. She had been treated for various troubles without any relief of her nervousness. The headache was over the left eye and radiated toward the ear of the same side. There was some sensitiveness on pressure over the walls of the sinus. Removal of the middle turbinate with probing of the sinus revealed pus in the cavity. The light was negative in this case, both sinuses illuminating alike. With washings and applications of silver nitrate her condition is much improved and recovery is confidently anticipated.

Miss M. B. had headache for nearly a year following an operation for appendicitis. The pain was localized over the left eye; the walls of the sinus were sensitive on pressure. Transillumination was negative. No pus was present in the nose. The middle turbinate was enormously hypertrophied, preventing drainage from the sinus. After the removal of the ante-

rior end of the turbinate, the pain disappeared and has not returned. This was probably acute frontal sinusitis.

Mrs. A., following an attack of "grip," had agonizing pains on both sides of the head and over the right eye. The attacks would begin on awaking in the morning and increase in severity until 11 o'clock, at which hour her sufferings would begin to diminish. In the afternoon she would be fairly comfortable. The tissues of the nose were inflamed and swollen. The middle turbinate was removed and the frontal sinus washed out. In addition to the sinus affection the posterior ethmoid cells were filled with pus which gushed out on the removal of the turbinate, and which probably was responsible for the pain in the sides of the head. During the paroxysms, the patient suffered excruciating pain and had to be kept under the influence of morphin. This was a case of acute frontal sinusitis.

In analyzing the foregoing cases, it will be found that most of them occurred on the left side of the head. I have repeatedly noticed the frequency of left-sided empyema of the frontal sinus. Of the four cases in which operation was done externally, three were on the left side. In nearly all cases in which the middle turbinate was removed, prompt relief was obtained; the operation was particularly efficacious in the catarrhal conditions of the mucous membrane. In such cases the headache was usually relieved without further treatment. When tenderness of the walls is persistent and no pus can be found, I do not hesitate to advise removal of the anterior end of the turbinate. The operation has never failed to do good in my cases.

The treatment of frontal disease sinus must be prompt and radical if we wish to relieve our patients. All nasal obstructions should be removed at once and an attempt made as soon as possible thereafter to wash out the cavity. Many cases are permanently relieved by such procedures. In persistent headache in which intranasal treatment has failed to relieve, we must resort to more radical measures. The increasing number of deaths from sinus disease makes it necessary for us to do something to save our patients from such a fate. It is then that the various external operations have to be considered. My experience with the Coakley opera-

tion has been so satisfactory that I shall continue its use in indicated cases. Killian's operation may heal quicker but I do not see how the integrity of the superior oblique muscle can be preserved where so much bone must be destroyed. It is our duty to do our best for our patients without exposing them to unnecessary risk. I have done the Killian operation on the cadaver but I have never been willing to guarantee to my patients that no diplopia would follow it. The Coakley operation is much simpler and safer and the anterior ethmoidal cells can be curetted through the frontal sinus. As I have before stated, the healing is protracted but I find that patients do not object so seriously to this feature if they have been relieved of their sufferings. In my cases the results were satisfactory—in one patient the sinus was very large, extending almost to the external angle of the orbit. The cavity closed nicely with a small depression.

## WHAT HEALTH DEPARTMENTS CAN DO TO SECURE PURE MILK BY THE PERMIT AND LICENSE SYSTEM.<sup>1</sup>

BY

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No article of food involves greater possibilities of danger to health than milk. It has been the medium of disseminating contagion time and again; of creating a monstrous infant mortality; and the fact is accepted, after ample experimental and pathologic investigation, that it is a source of transmitting bovine tuberculosis, particularly in early life. This, and the fact that milk, with the possible exception of wheat, is the food most universally used, and that it is peculiarly subject to infection, being a culture medium of high order, has necessitated the closest scrutiny and supervision to guard against the possibilities incident to it. Notwithstanding, safe, pure milk is not yet a

<sup>1</sup> Read before the Seventh Annual Conference of Sanitary Officers of the State of New York at a meeting held in Buffalo, New York, October 16, 17, 18, 1907.

general reality, and many features connected with its production are unsatisfactory and dangerous.

A survey of the situation, as it is today, shows a condition presenting opportunities for contamination at every step, from production to consumption, but principally at the source where faults, once created, irrevocably remain throughout, entailing, in consequence, an elaborate system of supervision, always open to criticism. It is pertinent, therefore, to refer briefly to the conditions which contaminate; to indicate the lines of improvement; and to point out the best methods of securing them. My remarks specially relate to the industry in this section, but indicate a condition which, with minor differences, prevails generally in cities of this class.

Dairies may be arbitrarily classified into three grades:

First—there are, in this State, a certain number of dairies that fulfill the highest requirements of sanitation; are conducted with a full understanding of the business; and a proper appreciation of its possibilities; and the sole aim of which is the production of milk of the purest and best quality. They stand alone, are models of their kind, and some, if not yet commercially successful, are educational and encouraging.

There are others, and a large number, of a second grade, with which the production of milk is either the sole or most prominent feature, and which, while not fulfilling the standard, recognize the deleterious possibilities and maintain a degree of care and cleanliness that is commendatory.

There remains a third large class in which we find a number of farmers with whom milk is but one of their outputs, and whose sanitation and methods are far from good, indeed, are frequently bad. To this class sanitation does not appeal; they will not obey, and to them the cost of betterment is not justified, and even if it were, they would not make it. Such producers are an ever present menace and danger.

In general, in proportion as the business is

the sole production of milk, and when the herds are large, conditions are better.

The features at the dairy which cause contamination are as follows:

Animals are not tested, periodically examined or groomed, or provided with suitable environments or properly milked.

Clean milk cannot be had from dirty animals or from animals cared for in the midst of unsanitary surroundings, dark, dusty, ill-ventilated barns. In the latter—and there are too many of them—dust and dried excreta abound, while the beasts, themselves contaminated, disseminate contagion with every movement during the milking. So, that from conditions possible with the animals and from their environment, the product, at its very inception, is infected. The subsequent course of the milk subjects it still further to contamination. The farmer's idea of cleanliness not being that of the sanitarian, the cans and utensils, the cooling process and the general procedure all continue the infection.

From the dairy the milk is hauled to the station—one farmer frequently acting as collector for many, or even taking small outputs and mixing them with his own, thus losing the identity of the several products and surely resulting in contamination. After varying periods at the station, with exposure to all kinds of weather, in cans open to criticism, it is hauled by rail, without refrigeration, to the city (Buffalo), where it is turned over to the retailer upon whom its future condition depends. He receives the milk within 24 hours, at an average temperature of about 50° F., and proceeds to prepare it for the trade, all which involves air and other exposure, manipulation, etc., with accompanying risk.

There are about 400 milk dealers in Buffalo handling approximately 34,000 gallons of milk daily.

The conventional duty of the retail dealer principally consists in removing a certain amount of cream by separator, and bottling. His further duty is to keep the milk refrigerated; to maintain a sanitary condition of the milk house and cooler; to have scrupulously

clean utensils; to follow a system of bottle cleaning that is safe and thorough; and to live up to the city ordinances, especially those relating to contagious diseases and adulteration. In each and every detail, a slip may occur, through carelessness, or evasion, or by intent, bringing undesirable consequences.

The responsibility of policing the business and protecting the public is placed by the State upon the Department of Agriculture, the city additionally surrounding itself with such safeguards as the situation demands. Owing to the inefficiency of the former, the latter has to guard not only against possibilities within its own borders, but from those beyond its jurisdiction.

The State supervision is open to criticism. It is inefficient in that there is no systematic inspection, and in that what irregular work is done in this line is upon complaint or hearsay. Even when initial, it proves secondary to other work, when one area is looked over at a time.

As the city of Buffalo is supplied from many hundreds, if not a thousand sources, not less than 500 of them being in the Ninth District, comprising Erie, Niagara, and Orleans counties, the State's surveillance is practically farcical. Many dairies have never been seen or inspected by the State authorities.

With the exception of instances of contagious disease in animals, where quarantine can be established, there is no procedure for closing an offending dairy without a ten days' notice, during which time milk can continue to be produced and shipped. In these circumstances, it is only through cooperation of the city authorities in interdicting the milk that the danger resulting from its possible use is averted.

Examinations of milk are not made as to their bearing upon health, but merely as to its commercial standard. During the past year, only 35 samples were examined from the country, of which 11 were obtained from dealers who were fined—33 percent. If this percentage of commercial fraud was perpetrated, what attitude would these delinquents be likely to maintain toward cleanliness, particularly if it

implied cost, and in the absence of inspection? Further, no uniform standard is required at the dairies; instead of their coming up to a standard requirement of sanitation and equipment, sanitation is applied to all sorts of equipment and conditions with obvious unsatisfactory results.

The city protects itself in maintaining a record with detailed data of the various supplying dairies—by inspection and by arbitrary interdiction of unsatisfactory milk, from whatever cause and upon suspicion, pending investigation as to specific gravity, temperature and the like.

It causes examinations to be made on arrival, and samples taken for bacterial count. Milk houses are scrutinized daily as to every particular of sanitation, procedure, and bottle washing; and surveillance is exercised over street peddling and house delivery as well as grocery dealers.

An itemized system of recording contagious disease in connection with each individual milk route, by means of the "telltale" register, which is scrutinized daily, shows when any particular route has contagious disease upon it beyond a particular number; the milkman's business is investigated at once, and the etiologic conditions localized. Another writer will speak of the epidemics that have been checked in their incipency through this system.

The bacterial count is the index for official action. When above 500,000 per cc., investigation is instigated. I believe a greater security would be obtained and the public best served if the possibilities were centralized, and sanitary effort was there concentrated. As liability to contamination is greatest at the source of production, and next with the city dealer, it would appear that with a standard dairy, a system that would eliminate deterioration and contamination beyond it, and a quick delivery, the consumer would get the product as near to nature as possible. To this end, a radical change would or should obtain, and along these lines is the department's action exerted.

The Department of Agriculture, as at present constituted, being unequal to the situation, the

industry should be placed with a State Bureau of Dairies, under the State Department of Health, with facilities, powers and equipment, technical and administrative, that the situation demands. The field is so enormous and so intimately connected with the public welfare that the State is justified in creating a special control, even though it would necessitate large expenditure.

By such bureau, the license system should be adopted. No system of control to prevent injury to the public welfare and further sanitation could be so satisfactory. It has demonstrated its efficiency wherever applied, not only in protecting the public but furthering and improving the interests themselves. While not a contract, it should be given only in consideration of the fulfilment of certain conditions of the sanitation and methods that our present knowledge has demonstrated to be necessary and efficient. The licensing power should be vested with the enforcing authority, and be revocable without notice or hearing when the conditions it is based upon are violated, which should be specified in the license. Many license enactments necessitate "notice and hearing to show cause why" before revocation, which delays procedure and modifies moral effect. It has been suggested that, if feasible, a small bond should be exacted for faithful observance, which is, however, an open question.

The policy of the State, the intent of the enactment, should be to foster the dairy where milk is the sole product, and minimize and, if possible, gradually eliminate, so far as supplying the city is concerned, those with whom its production is a side issue and where high sanitation is not possible. Incidentally, this would entail no great hardship to the latter, for generally that interest is small—an average of eight to ten cows, which are generally kept for their manure, their product about equalizing their cost of keeping in the winter. With this class, their product could go to the manufacturing industries—butter and cheese, where the manipulation and process modifies contaminating possibilities.

While it is desired that all dairies be uniform, those supplying the city milk might be specialized and a high standard demanded and be differentiated from the lesser ones where the product goes in other channels. In other words, grade them and direct their product according to their sanitary standard.

The requirements to operate a dairy under the license system should be based upon the following essentials:

1. Tuberculin test, periodic examinations, and sales to dairies, to be accompanied by veterinarian's certificate of condition.
2. Buildings of concrete or impervious construction, troughs and gutters the same, to prevent absorption and permit flushing. A system of ventilation independent of windows, abundant light, and proper cubic air space.
3. Grooming, and aseptic precautions for the milker and for the animal, in milking.
4. Modern improved utensils which lessen air exposure.
5. Immediate rapid cooling and emptying into sealed containers for retail consumption.
6. Ice and steam.
7. The adoption of a satisfactory standard container for wholesale shipment which should be limited to wholesale consumers, such as factories, ice cream factories, hospitals, hotels, and the like.
8. Uniformed, intelligent attendants. An advance would be made, if, during the winter, those in the dairy sections could receive through the State instruction in dairy sanitation and principle; and those who are qualified in such manner should receive preferment in work and pay. Place the dairy attendant on a plane with skilled, instead of unskilled, labor.
9. Systematic inspection and a system of careful reporting.
10. Use of sealed containers, that the product may be put up at dairy for delivery to retail consumers.

While State control of the industry in the country, under a license system on the lines indicated is an urgent necessity, it is not to be assumed that in its absence equivalent safety

cannot otherwise be attained. Through the permit system, a control can be maintained which, while not so complete or comprehensive, will be likely to bring satisfactory results.

Its essentials are that no dairy can ship into or sell within the city any milk without first obtaining a permit from the municipality. This should be contingent upon sanitary conditions and modes of procedure satisfactory to the Department of Health. The power to interdict any milk at the city line or to prohibit any milk dairy in the city from receiving milk from any specific source, furnishes the necessary means of enforcing municipal requirements.

In these circumstances, the following are required:

Each dairyman supplying the city with milk must obtain a yearly permit which (as with the State License System), is issued only subsequently upon inspection, and after certain requirements of sanitation and procedure are complied with.

The Department of Health, in addition to having a detailed record of the dairy in all matters pertinent, should maintain a system of official monthly inspectors' reports upon all matters, as may be indicated.

Municipal sanitary officers have no greater ally than the press, so that publicity is their "big stick" since, to the possible delinquent or offender, the fear of it is more dreaded than fines. With this in mind, the periodic publication of the rating of the dairies and city milk houses for public enlightenment is advisable. This feature can be most admirably utilized in relation to the sanitation of all industries depending upon public patronage, especially foods, and their preparation.

Much of the care and protection given milk in its passage to the consumer is neutralized by the conditions to which it is subject after reaching the consumer. This being beyond the direct control of official action, the possibilities can only be met by education, by the diffusion of knowledge among the masses, of all grades, as to the sanitary care of milk and

the untoward results of negligence. To this end, I would advocate the labelling of each container in one or more languages, with concise information, the nature of which could be varied, in summer, with special reference to infant and child feeding. In other words, I would make the paper milk container an educator as well. Reaching, as it would, almost every household, it would daily reiterate the cardinal rules for milk care until they would be indelibly fixed in the mind.

There has been recently introduced the paper paraffin-lined aseptic milk container for single service. The advent of this device eliminates the possibility of the bottle, permits milk to be put up at its source, protects it from contamination in its subsequent course, and tends to simplification of the whole matter. Its general adoption would convert the city milkman from a manipulator to a distributor, and for the dairy doing the work for him, the expense of separating, bottling, and refrigeration would be eliminated, which, with public enlightenment (and the public has never been so alive to sanitation and the milk question as now), and appreciation that cheap milk means unclean milk, and an advanced price, would increase his profits.

If the mission of the single service milk container is limited to supplanting the bottle trade as, at present, existing, its advent means much.

The possibility of infection from bottles will continue so long as they are in service, for, while beyond the control of the milkmen and in possession of the consumer, they are frequently used in domestic service for other purposes, clean and otherwise. The Department of Health of Buffalo has had its attention called to their being used in sick rooms infected by contagious disease, for "ducks" in nursing, and for various other contaminating offices, all of which is beyond the reach of ordinance or inspection. The paper container precludes the possibility here mentioned.

With the large standard dairy preparing the product for consumer, and the milkman a distributor, there remains the transportation

feature; for, at the present time, no protection is afforded, other than the open platform, the bare service car, and terminal sheds, so that much of the expense and effort in cooling at the dairy is offset by its subsequent unprotected journey.

A low bacteria-retarding temperature is an essential for milk integrity. Cooled to the proper degree and maintained so, pure, good milk will keep until utilized. The proper transportation of milk requires not only refrigerator cars, but cooling facilities at collecting stations where the product frequently has to wait long periods for train arrivals. Therefore, coolers should be maintained and their efficiency and sanitation be under surveillance. Terminal coolers are not so strongly indicated, inasmuch as removal is immediate upon arrival.

It is, however, important that the wagon haul to distributing points be with full protection from the sun, and it is surprising how efficient a small amount of ice, properly placed under canvas coverings, can be made. It is not too much to assume that, with the evolution of the greater advances, the lesser ones will materially grow apace, and the creation of a delivery and hauling wagon adapted and equipped to maintain a low temperature will be in evidence.

The transportation and temperature features being defined, it only remains to bring about uniform action with each link in the chain.

In the absence of steam sterilization, which but few milkmen employ, a cleansing for re-use cannot be expected.

Contamination of milk is in evidence from cow to consumer with greatest deleterious possibilities at its source, which, when consummated, are permanent. A stricter supervision must be instituted, and there must be a more rigid enforcement of sanitary laws, if our milk supply is to be materially improved.

The remedies are:

1. Supervision and control by the State, through a special bureau equipped technically and administratively to meet the requirements.
2. The establishment of a dairy standard

and the control of the milk industry by the license and permit system.

3. The policy to foster the evolution of the standard grade large individualized producer, and the extinction of the small menacing contributor.

4. Direct preparation of the milk at the dairy for consumers' use, by converting it into a preparer and not a mere producer.

5. The adoption of refrigerator cars for milk transportation, and cooling sheds at stations.

6. Conversion of the city milk dealer from a manipulator to a distributor.

7. The abolition of the existing milk cans and bottles, and the adoption of the single-service paper container for direct consumption from udder to mouth, from teat to tongue. Make the container an educator as well, by labelling it with pertinent facts. The diffusion of knowledge through this channel will bring enlightenment and create the sentiment most necessary to improvement.

No modern pasteurized, sterilized, or certified milk can compete with the raw milk from a healthy udder. It has no possible substitute.

This close tie between cow and consumer must not be severed by manipulations that are deleterious, and by cans and bottles that are unsanitary. The study of a wholesome milk is the study of nature, which is ever ready to repair an injury or furnish a remedy, if we will but heed her teachings.

Therefore, in conclusion, I wish to emphasize that "in our attempts to aid and imitate nature, common sense will establish limitations and keep us away from gross scientific errors."

## NOTES ON CATARACT OPERATION.

BY

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The following notes, suggested by the questions of assistants and students, as well as by the mistakes which I have made and those which I have observed, are a record of some

of my personal experiences and observations during 25 years of active work in eye surgery. This might be expressed in the words—"As it seems to me."

In deciding whether the simple or compound operation for cataract shall be done, the following points should be taken into consideration: The condition of the lens plays an important role. If the lens is large it will be more difficult to deliver it through the natural pupil. It must be borne in mind that calcareous lenses are sometimes large—sclerosed lenses are usually so—and that both are unyielding. The tractability of the patient also is an important factor in deciding the mode of operation. If there is reason to believe that the patient will be restless and will be controlled with difficulty during the first 24 or 48 hours after operation, the combined operation is the safer one, for, under these conditions the danger of prolapse of the iris will be greatly increased. Another condition will be found in the natural width of the palpebral fissure. If the upper lid normally covers the cornea as far as the upper margin of the pupil an iridectomy will cause very little inconvenience. If, on the contrary, the entire cornea is normally uncovered by the lid, an iridectomy, permitting as it does the light to pour into the eye from above, will be a source of great inconvenience.

The condition of the iris should also be taken into consideration. If the pupil is normally small, or the iris sluggish in its movements, as is often the case in very old or gouty people, the difficulty of delivering the lens will be greater and will be increased by the inelasticity of the eyeball. The iris will also suffer more from traumatism and will be less easily replaced and retained in place.

Without doubt, the combined operation is the safer one, but, as already shown, there may exist conditions which modify this inequality. If the iris is tremulous, indicating either a ruptured zonule or a fluid vitreous, the combined operation has the advantage of offering a safer procedure.

Having decided on the mode of operation,

the next consideration should be the condition of the eyelids. If pathogenic germs are found here the operation is contraindicated; a smear should be taken and a microscopic examination should be made in all cases. This has been the routine practice in the New York Eye Infirmary for four years, and in the cases in which the warning of the microscope has been neglected, disasters have been frequent.

The condition of the conjunctiva may be perfectly normal apparently and still pathogenic germs be found; until these disappear, the operation should not be undertaken. Inspection of the canaliculus, of course, is to be made in all cases.

The simple extraction will be first considered. In regard to the location of the section operators differ. My personal preference is to make both punctures at the limbus and carry the section slightly backward until it terminates in a conjunctival flap. This favors an early closing of the wound, which is a bar to infection. The section should be as smooth as can be made and should be finished slowly. If too much traction is exerted on the knife the cornea will wrinkle and the result will be a ragged wound with premature escape of aqueous, which will be slow in healing. The ideal section would be one that could be completed without the escape of aqueous. This being impossible, let us approximate it as nearly as possible. The light should be so arranged that there will be no troublesome reflex at the points of puncture or counterpuncture. The knife should be held so lightly that it may be sensitive to the least movement of the eyeball; otherwise the aqueous may escape before the edge of the knife has passed the pupillary margin, allowing the iris to fall over it. If this should happen, in many cases it may be saved from injury by advancing the knife slowly, cutting first with the point and then with the blade near the shank—as it is sometimes called, heel and toe movement. This is a very delicate operation and will not always succeed. It is a safe procedure to have the speculum raised by an assistant in such a manner as to lift the lids away from the

globe. In most cases it is safer to remove the speculum after the section is completed.

The method of capsulotomy is often a cause of argument. My preference is for a thorough capsulotomy, circular in shape, and as large as the normal pupil, thus leaving only one membrane in the pupillary space instead of two which will sometimes occur if the capsule is simply split open. The capsulotome should be so held that it can be instantly removed if the eye rotates upward; otherwise there will be danger of its dislocating the lens or becoming entangled in the iris. The method of delivering the lens varies with the operators. I have good reasons for the following:

The spatula should be placed on the sclera above the section and the spoon at the limbus cornea below. Gentle pressure is then brought to bear on the spoon and only enough on the spatula to open the wound slightly. As the lens moves slowly upward it should be closely followed by the spoon until the lens is expelled. The pressure on the cornea should not be in the least relaxed until the spoon has reached the edge of the wound. If this pressure is intermittent some fragments of the lens will become detached and may fall below the point of pressure; their subsequent removal will be difficult. This procedure should be repeated with less pressure followed by irrigation of the anterior chamber if necessary. I purposely suggest irrigation before the replacement of the iris for the reason that the stream of water used in the irrigation will often replace the iris. If this does not follow, then the edge of the wound should be gently elevated with the spatula to allow the iris to replace itself, which it will sometimes do.

There is only to add for the combined operation the manner of doing the iridectomy. We all like to see a symmetric coloboma. There are two ways of securing this result; one by a single cut, the scissors being held exactly in the vertical meridian—but if for any reason it is advisable to obtain a deep coloboma including the base of the iris, by the following method:

The iris, having been grasped at or near the sphincter and withdrawn as far as necessary, each side of the fold of the iris is cut separately so as to leave intact the narrow strip

of iris at its base. This may now be still further withdrawn and severed by a third cut close to the cornea, care being taken not to injure the conjunctival flap already described. This method carried out with a steady hand will result in a beautiful symmetric coloboma. If the iris is not returned to the anterior chamber by the methods already described, the spatula must be used, and always as a last resort. This instrument should be inserted at the angles of the wound and gently drawn toward the center of the cornea, and should not be allowed to pass beyond the edge of the iris, for the reason that if allowed to do so it will come in contact with the posterior capsule, to the imminent danger of the latter.

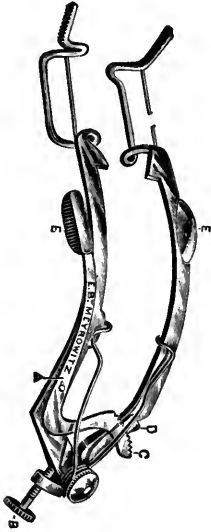
The behavior of the iris will determine whether atropin or pilocarpin should be used after the extraction. In simple extraction in which the iris has suffered undue traumatism, or for any reason does not assume its normal place, pilocarpin is of great value in assisting it to do so.

The pad placed over the eye should be thin in the center and thick at its periphery in order to adapt itself to the convexity of the globe.

The choice of the cataract knife should be determined by its length, shape, and the condition of its edges. An extremely hollow ground knife will allow premature escape of the aqueous; for the same reason the back should not be too abrupt. Its point should not be too tapering. An attenuated point is difficult to see in the anterior chamber, especially so if there is present an arcus senilis. A longer knife is necessary if the eye to be operated upon is very large than if it is a small one. The edge of the knife should be tested its entire length; it is not alone necessary to test the point. The capsulotome should be slightly sickle-shaped at its point and not rectangular, for the latter will not cut the capsule cleanly, but tear it, and if the capsule happens to be tough there is danger of dislocating the lens.

The speculum should be capable of instant removal. If the spring is too strong, or the locking device complicated, valuable time will be lost in its removal in case of emergency. I have designed a speculum which obviates

some of these defects. As will be seen in the cut, one thumb piece is attached to a locking lever. And the act of grasping the instrument to remove it from the eye at the same time unlocks it. This instrument can be instantly removed from the eye without hazardous delay in unlocking it.



I wish to add a few words regarding the extraction of Morgagnian cataract. In making the capsulotomy care must be exercised to avoid making it too central or too near the periphery. In the former case there will remain a pocket at the upper border of the capsule into which the nucleus may recede and from which it will be difficult to extricate it. In the latter case there is danger of perforating the posterior capsule.

The operation for soft cataract as usually performed, in my opinion, is faulty. The section should be made with a keratome in the cornea just outside the normal pupillary space. The operator whom I first saw select this point for section was Dr. P. A. Callan. The capsule if not too tough may at the same time be opened. The keratome should then be slightly withdrawn and depressed to allow the aqueous to assist in the expulsion of the soft lens matter. The keratome in entering the cornea should be advanced exactly in the plane of its blade in order that the aqueous

will not escape until the section is complete. When the aqueous gushes out the lens moves forward, and unless the preceding method is employed the posterior capsule coming in contact with its point may be perforated. This danger is also present when considerable force is necessary to carry the keratome through the anterior capsule. In case of thickened capsule the capsulotomy should be done with a capsulotome.

Occasionally a lens will be so thoroughly disorganized that it will retain no trace of structure—its condition will be flocculent or gelatinous; the former is easily removed, the latter with considerable difficulty, as will also be the case when some portion of the original lens structure remains. I have found the most satisfactory procedure to be as follows:

When the keratome is finally withdrawn a grooved and bent spatula is introduced and turned transversely in the wound, a stream of warm sterile salt water (normal salt solution) is directed upon the spatula at the point where it enters the wound, from a syringe. I prefer the siphon irrigator. The fluid will follow the curve of the spatula creating brisk current in the anterior chamber and will flow out again bearing with it the lens matter. If the lens is in a flocculent condition this method will remove all of it, leaving a clear black pupil. If the lens matter is gelatinous, or retains its structure, it will be necessary to introduce the spatula and disintegrate what remains, repeating the maneuver until it is all removed, using greater care as the spatula approaches the posterior capsule. It is rarely the case that a second operation is required when this method is employed.

I wish to add a few words in regard to the first examination of the eye after the operation. This is always a critical procedure. I have found it safest to pull down the lower lid before attempting to raise the upper one, and, of course, shield the eye from too strong or too direct light. The patient should be cautioned not to look downward too far. This movement sometimes springs the wound open. If the wound fails to heal promptly, the patient should be allowed to get out of bed wearing, of course, a bandage lightly applied and a protecting mask.

## CLINICAL NOTES.

THE SURGICAL TREATMENT OF APPENDICITIS  
DURING THE PERIOD INTERVENING BE-  
TWEEN EARLY OPERATION AND THAT  
OF A LATE, DELAYED OPERA-  
TION IN AN ACUTE ATTACK.<sup>1</sup>

BY

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A question which often arises in the mind of the surgeon when he receives a case of acute appendicitis after the period of 36 or at furthest 48 hours have passed from the onset of the attack is, shall I follow the dictum of Dr. Ochsner and wait until the eighth day from the onset before operating, using the starvation treatment, or shall I do as Deaver and others advocate, operate as early as possible, removing the appendix at the operation?

Deaver only refuses to operate on moribund patients with diffuse peritonitis complicating the appendicitis. Many follow Ochsner's plan, which is probably the safer for most surgeons, but perhaps nearly as many who operate still follow the latter plan and operate during the forbidden period, *viz.*, the third, fourth, fifth, sixth, and seventh days, removing the appendix even if considerable manipulation of the intestines is necessary to accomplish its removal.

The best plan to pursue in cases during this period is, in my opinion, a matter of great importance and it is by no means settled in the minds of many who operate for appendicitis. It is not difficult for a surgeon to refrain from operating if the acute symptoms are subsiding, and there is less pain, rigidity of the rectus muscle, fever, and a slower pulse, stoppage of nausea, etc., but it is different when the reverse is the case. The temptation to operate without further waiting is then very great, and the surgeon who waits for the eighth day in such cases must exercise a good deal of stoicism.

About a year ago when reading of the brilliant results of Murphy, Deaver, Howitt, and others in dealing with acute diffuse suppurative peritonitis by opening the peritoneal cavity in the pelvic region, putting in drainage, and placing the patient in the Fowler position, it occurred to me that the same line of treatment was indicated during the period spoken of in acute appendicitis, making the opening in the peritoneum over the region of the appendix and an additional one above the pubis if general peritonitis is present. This plan I believe to be

<sup>1</sup> Surgeon to Victoria Hospital.

correct in principle and thoroughly practical. A small drainage opening is all that is required. A split rubber drainage-tube with a strip of gauze in its lumen is inserted pretty well down and is allowed to remain for a few days, until about the eighth day from the beginning of the attack, when an operation for the removal of the appendix can be undertaken with comparative safety. The bowels should not be manipulated at all in the operation for insertion of drainage, only make incision, insert tube and place patient in the semisitting position and treat in other respects as advised by Dr. Ochsner.

This simple operation will often help the surgeon who is debating what is best to do, in a perplexing situation, as it comes somewhat between the two extremes, the one being a radical or complete operation, removing the appendix, and the other being expectant treatment entirely, and as often happens, when wide difference of opinion exists the "happy medium" is the best plan to pursue.

It can be readily seen how the tendency to spreading peritonitis is lessened by this procedure, and this is after all the main object to be sought for in those cases of appendicitis coming to the surgeon too late for an early and comparatively safe operation, while the infection is confined to the appendix. The lessening of the resistance by means of the incision and the carrying off of the infection and exudate by the drainage will lessen the number of cases of diffuse general peritonitis complicating appendicitis, and also I believe will be followed by fewer local adhesions.

The only criticism that I can make of the foregoing method is that the drainage-tube may press constantly on one part of the bowel and cause a fistula through slough. However, there is very little risk of this occurring if the tube is placed carefully. A glass tube may be preferable to the rubber. I am convinced that the mortality in acute appendicitis coming late for operation could be materially lessened by adopting this line of management. This, however, can only be shown from the comparative tables of large numbers of patients thus treated and those of patients treated by the other methods mentioned. My experience with this method is rather limited, but it has been entirely satisfactory in the few cases in which it has been tried. My object in writing this paper has been to call the attention of surgeons of larger experience to this plan of treatment with the hope that some of them may give it a trial in a sufficient number of cases to prove its value.

## SPECIAL ARTICLES.

### IS THE VITAL PRINCIPLE PONDERABLE?

BY

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In *American Medicine* (N. S., Vol. II, No. 4, April, 1907) there was an article by Dr. Duncan MacDougall, of Haverhill, Massachusetts, entitled an "Hypothesis Concerning Soul-Substance, Together with Experimental Evidence of the Existence of Such Substance;" a discussion of these experiments appeared also in the *Journal of Psychical Research*, and the daily press made news of its deductions. The article attacks the doctrine of the soul's simplicity and spirituality, and indirectly all that follows therefrom, and it therefore demands criticism.

The author placed upon a scale a patient dying of tuberculosis, and at "the instant of death" this patient suddenly lost three-fourths of an ounce of weight. The loss apparently was not due to evaporation of moisture or expiration of residual air. It was inexplicable to the experimenter, and he asks, is this loss due to the departure of the patient's soul, or equivalently, did the patient's soul weigh three-fourths of an ounce? He answers interrogatively, "How other shall we explain it?"

In a second experiment, also upon a tuberculous patient, there was first a sudden inexplicable loss of one-half an ounce when the patient's respiration ceased, and a total inexplicable loss of one ounce and a half and 50 grains after the patient's facial muscles and heart had ceased to move. Dr. MacDougall tells us this patient's death, "was very gradual, so that we had great doubt from the ordinary evidence to say just what moment he died."

In the third case, tuberculous also, there was an inexplicable loss of half an ounce of weight, "coincident with death, and an additional loss of one ounce a few minutes later." (Italics are mine.)

The fourth experiment he rejects as "of

no value." In a fifth case there was an inexplicable loss of about three-eighths of an ounce, "exactly simultaneously with death." The experimenter added weights, apparently equivalent to three-eighths of an ounce, to the patient's bed till the scale-beam went up; he next removed these weights from the patient's bed but the beam remained up for 15 minutes "after death," and finally sank. In a series of experiments with 15 dogs, there was no loss of weight at death.

The argument of Dr. MacDougall drawn from these experiments centers about the assertion that at the moment of death in four cases there was a loss of weight, inexplicable to the experimenter, of from three-eighths to three-fourths of an ounce, and he concludes that this loss most probably represents the weight of the departed soul; secondly, the experiments "will prove also that the spiritualistic conception of the immateriality of the soul is wrong."

At the beginning of the article he says: "If the psychic functions continue after the death of the brain and body, then such personality can only exist as a space-occupying body. . . . It is unthinkable that personality and consciousness continuing personal identity should exist, and have being and yet not occupy space." He says, moreover, that "conscious life and personal identity" are possible only where there is a *basis* of substance, and he twice defines substance as space-occupying material. He thinks that the "space-occupying substance," which is man's soul, is *gravitative*, ponderable, and that it is not ether, because ether is "a continuous whole, and not capable of existing in separate masses as ether, whereas the one prime requisite for a continuing personality or individuality is a quality of separateness." That is, ether is simple and extended at the same time, personality and individuality are synonyms, and personality, individuality and separateness are qualities, which ether lacks; if ether is not individual it does not exist, but we shall discuss this hereafter.

The space-occupying body, which is the

soul of man, is lighter than the atmosphere, he further says; and this is "a fact of great signification, as such a body would readily ascend in our atmosphere." Why capability of ascension is a fact of great significance he does not explain; nor does he inform us what would become of the soul when it had reached the limit of terrestrial gravitative attraction. Is there any connection between the "great significance" of this capability of ascension and the attainment of Heaven? Does it finally settle the geography of Heaven?

Finally, "In the year 1854 Rudolph Wagner, the physiologist, at the Göttingen Congress of Physiologists, proposed a discussion of a 'special soul substance.' The challenge was accepted, but no discussion followed, and among the 500 voices present not one was raised in defence of a spiritualistic philosophy." Before discussing the article, we may remark that the statement concerning the Göttingen Congress merely emphasizes the disagreeable consciousness that, like physical scientists in general, no one of the 500 physiologists at Göttingen was familiar enough with spiritualistic philosophy to attack Wagner's assertions. It is practically an axiom that the more any physical scientist knows of his specialty the less he knows of anything else. Physicists know little of any philosophy, and nothing of spiritualistic philosophy. Before a man may speak seriously on a philosophic subject he must have given philosophy at least as much study as he would have given to medicine before he gets a hearing, and in my 30 years' experience as a student and teacher in American, German, and Italian colleges I never yet met one physicist whose knowledge of spiritualistic philosophy arose beyond the rudimentary, except a few men in schools like Georgetown University.

Dr. MacDougall's article, drawn from four experiments, three of which are decidedly doubtful, supposes, (1) that his patients were really dead at the moment he observed the loss in weight; that cessation of respiratory muscular action and of the audibility of the heart-sounds signifies death; (2) that because

he could not explain the loss of weight, there is no possible explanation; (3) that substance is merely a space-occupying body; (4) that personality cannot exist except in a space-occupying body; (5) that the soul is material.

1. That a man ceases to breathe, and that a stethoscope can find no heart-beat are not proofs of death. Sick<sup>1</sup> reported the case of a boy who "died" upon the operating table. *Three-quarters of an hour* after the heart had ceased to beat and respiration had ended, the heart was laid bare. The flaps did not bleed, the pericardium was bloodless, the heart was motionless, relaxed, and cold. After another quarter of an hour, that is, one hour after what Dr. MacDougall or any other physician would call death, by heart-massage and artificial respiration, the boy was so far resuscitated that he became conscious and complained of thirst and dyspnea. He lived in that condition for 27 hours, during which time his speech was intelligible; then he really died. Medical literature is becoming dotted over of late with reports of similar resuscitations. See, for example, Dr. W. W. Keen's article in *The Therapeutic Gazette* for April, 1904, wherein some of the facts are collected. In my book on *Pastoral Medicine*, from these resuscitations I drew an argument in favor of conferring sacramental rites upon persons who have been apparently dead for an hour or two.

That Dr. MacDougall's patients lost weight inexplicably to him when they appeared to die is true; but it is a rather long stride from that inexplicability to a proof that the soul is ponderable. No man on earth has the faintest notion of the exact moment of death. The cessation of visible respiration and of audible heart-beats is the crude beginning of death, but death before it has reached the ultimate cell is a more complicated process than such cessation. Anyone that has done laboratory work in physiology knows that the heart of even a ten-pound dog will, if connected with a manometer, show unmistakable signs of life for five minutes at least after

<sup>1</sup> Centralblatt f. Chirurgie, Sept., 1903, p. 981.

respiration and heart-sounds have ceased; and a reptilian heart will even beat for hours after it has been cut entirely away from the body. I deny that Dr. MacDougall's patients were dead when the scale-beam dropped, and this decidedly reasonable objection makes his entire argument at least doubtful.

In his second case he himself says: "We had great doubt from the ordinary evidence to say just what moment the patient died." This case, therefore, proves nothing finally.

In his third case there was an inexplicable loss of half an ounce of weight "coincident with death," and, he adds, there was "an additional loss of an ounce a few minutes later." Does this inexplicable second loss suppose the man had two souls? It certainly makes the case useless in the argument.

So far there is only one case really worth consideration. He himself rejects his fourth experiment as "of no value." In his fifth case there was an inexplicable loss of three-eighths of an ounce at "death." Then a regaining of the three-eighths of an ounce, and after fifteen minutes a loss again of this three-eighths of an ounce. Did the ponderable soul go back for fifteen minutes? Whether it did or not, this case too is not *ad rem*.

2. Because Dr. MacDougall, or anyone else, cannot explain the loss of weight he mentions, it by no means follows that there is no explanation other than that the loss supposes the departure of a ponderable soul. Mysteries are apt to clear up into ordinary facts even after very wise scientists have striven with them for ages. A few years ago no man living could explain how a man is infected by yellow fever, but now it is a mere matter of mosquitoes; so for a hundred other quondam medical mysteries. That Dr. MacDougall or I cannot explain the loss of weight he noticed when his patient ceased to breathe means absolutely nothing more than that we are ignorant in this case; but the loss of weight has no *necessary* connection whatever with the soul's departure, except that this departure might be the cause of a reduction of weight in the *body* by the loss of some part of the

body unknown to us at present. Jumping over an obstacle is not the only manner of passing it.

3. Dr. MacDougall says the soul has a basis of substance, which is a half-truth; but when he asserts that a substance is necessarily a space-occupying body that is not even a half-truth. Substance as such has no necessary connection with space, and God, the only absolute substance, is not in space at all; God would not be God if He were in space. Dr. MacDougall confounds substance with matter. He employs the colloquial, dictionary variants of the term substance, whereas in the material under discussion the term is technical: Substance may mean anything from a merchant's savings to τὸ πῶτος ὄν καὶ ἀπλῶς ὄν, the "Being primarily and simply" of Aristotle, but here it is only the latter. A substance is something that can exist of itself; it is primarily and simply Being. If this substance, which can exist by itself, is concrete, if it has actual extension, that is, actual parts beyond parts (the only definition of extension), it is in space; if, on the other hand, it is an abstract substance, like Justice considered in itself and not as an attribute, it has nothing whatever to do with space.

The merest amateur in mental science knows that the term Substance is a subject of contention with all modern writers on philosophy. Descartes (*Princip. Philos.*, pt. i., n. 51), has one definition; Spinoza (*Ethics*) has another; Hume (*Treatise*), Mill (*Examination*), Bain (*Logic*), Lotze (*Metaphysics*) give other definitions; Kant, Hamilton, Reid, McCosh, and 50 others, all have definitions twisted in one direction or other, but not one makes it a "space-occupying body." Space is merely a relation in which some substances (those that are material) find themselves, and which has no more to do with the definition of substance as such than the floor of a room has with the definition of a man standing on that floor. An accident, which is the direct opposite of substance, may be a space-occupying body or not, dependent upon the nature of the accident. In the order of nature

material things occupy space, but even there if we consider the entire finite world as a unit it is not in space. Space is the superficies of the containing body considered as unmovable and immediately against the located body. Place is the bounding surface with reference to the interval included; space is this interval with reference to the bounding surface. Since beyond the finite world there is nothing, there is no superficies of a containing body that touches it, and the world as a unit is not in space; furthermore, for the same reason, it is not in any place. So, a substance that is not only not in space, but not anywhere, yet actually not potentially existing, is "thinkable." This is not hair-splitting, but a mere question of the exact use of English, which should be observed even in scientific articles, especially when they trench upon metaphysical grounds. The world does not exist *in* God except analogically. One might say, with a very loose use of words, that a man's soul occupies the same space as his body, but that is to say that it has *virtual* extension, that it operates throughout the whole body, but not that it has formal extension; it is as simple as its own ideas of truth, goodness, being, as we shall see.

4. Dr. MacDougall supposes that personality cannot exist except as a space-occupying body. He does not, however, define personality. Anything that can have a separate existence is a substance, and every existing substance must, of course, be individual. When an individual (one separate thing) is complete in itself, has an entire nature, and is intrinsically independent, it is an hypostasis. If, further, an hypostasis is intelligent, it is a person, it has personality. That is all personality means with men that use language with precision. Everything that has personality is an individual, but these terms are not convertible. A stone is an individual but it is not a person. The notion of a space-occupying body is altogether outside the essence of personality. The persons we know happen to live in bodies, but the bodies do not make the persons. God is a person, and He exists not as a space-

occupying body. He is neither a body, nor does He occupy space. He is a spirit; He is infinite, and He transcends space. An intelligent being, a person, existing with utter disregard to space, is as readily "thinkable" as anything else if you know how to think. The soul is a formally unextended principle, and no insistence will ever put legs on it.

5. Dr. MacDougall concludes that the soul is material, and this is relatively the most important part of his article. Let us grant that his patients, and a hundred other such patients, really died when he thought they died; secondly, that they really lost weight, ten pounds if you like, at the moment of death, for some reason at present unknown to us: the conclusion would be not that the soul is material but that the loss of weight is a bodily loss and that the soul nevertheless is a spiritual principle. The departure of the soul might readily, as I said before, be the exciting force which caused the loss of weight, but the body lost it; the soul lost no weight because it has no weight to lose. Loss of weight is a property of matter alone, and the soul is spiritual, as I shall prove. If a maiden abandons her lover, and he therefore rapidly loses bodily weight, does the loss of weight in his body represent the girl's "avoirdu pois," or prove that she is a space-occupying body? That is a case essentially similar to Dr. MacDougall's experiment.

The soul or mind is the subject of our mental life; it is a name for the ultimate principle by which we feel, think and will; it is the uttermost source of our individual conscious life. It is, therefore, a substantial principle, not a "basis of substance." When you pick out all the shoddy, made in Germany, in modern philosophy concerning "substrata" and the "noumenon," you find practical agreement among disputants: all finally grant that the mind is a substantial principle and opposed to the other division of being, accident, which needs a subject in which it inheres.

We are conscious, we know we have mental modifications, and there must be some subject to which these acts belong. Even if they

were acts of the nervous system they would still originate in a substantial principle. Cognitions and desires cannot start from nothing. The substance here is not a mere substratum of the ideas and feelings, like the foundation under a house, it thinks and feels; and we are as conscious of the fact that it thinks and feels as we are that we exist.

The substantial principle of our mental activity remains the same during all the changing modes of consciousness. Any act of judgment necessarily supposes a subject which persists unchanged while we pass from subject to predicate; any act of memory involves the identification of myself with the self which had the past but remembered experience. Lotze (*Microcosmos*, bk. ii, c.1) proves this assertion convincingly for those Christian scientists on the outskirts of philosophy who need such proof.

We know we can form abstract ideas, ideas of goodness, being, truth, and a thousand similar to these, and such are evidently indivisible or simple acts of the mind. An act of that nature is impossible to an extended, composite substance, a material agent, as the brain, for example.

If an extended or material soul could have an indivisible idea, of, say, Simplicity, either different parts of the simple idea must belong to different parts of the extended soul, which is absurd, as the idea has no parts; or, secondly, each part of the extended soul must be the subject of the entire idea, and this also is absurd, because we should then have as many entire ideas of Simplicity as there were parts in the material soul, whereas we know we have only one idea; or thirdly, the whole idea must belong to a single part of the extended soul. If the whole idea were in one part of the supposedly extended soul, this part should itself be either composite or simple. If simple the ultimate subject of thought is simple as I started to prove; if composite, the two absurd alternatives already refuted recur. Therefore, the ultimate subject of mental activity is simple, and since it is simple it is not extended, and since it is not extended it is not material.

The same demonstration can be made from the simplicity of the acts of judgment and inference, and from the indivisibility of volition, but there is no need for further insistence.

Simplicity and spirituality are not exactly the same thing: simplicity signifies a negation of parts; spirituality supposes independence from matter in existence, and to some degree in operation. The soul of a brute is simple but not spiritual; and soul of a man is both simple and spiritual.

We judge the nature of a subject by the nature of its operations, *actio sequitur esse*. If a being is the cause of spiritual activities, of activities independent of matter, the being must itself be spiritual, because an effect cannot transcend its cause (a cause is a principle which determines the existence of anything); an action cannot contain more perfection or a higher order of reality than is in its cause, nothing gives what it has not, nothing can act in a manner quite unlike its own nature.

The human soul, however, is the source of activities which are independent of matter. Professor Ladd, of Yale (*Philosophy of Mind*), proves this proposition, but we may in outline suggest the ordinary proof. We apprehend abstract truths, and ideas which have nothing to do with matter, such as justice, mankind, God, necessary existence, possibility, relation between ideas, logical sequences from premises, and so on indefinitely. Operations like these are spiritual phenomena, therefore the source of them must also be spiritual. If we were intrinsically dependent upon the body, upon matter, the mind could form only material notions, concrete ideas, physical impressions.

Again, self-consciousness proves the soul's differentiation from matter. The same soul in self-consciousness is at once and fully subject and object of the mental action, an operation utterly impossible to matter. Parts, atoms of matter, can act on one another, but no material atom can act on itself.

Freedom of volition also supposes a spiritual soul. We can tend toward suprasensuous good, to love of justice, truth, virtue, and so on,

but such tendencies are wholly spiritual. Moreover, no material faculty can determine itself, but the human soul can determine itself.

It is impossible in an article like this to develop these arguments, but a very little thought upon them shows the impossibility of Dr. MacDougall's contention that the soul is ponderable.

## DIGEST OF LITERATURE.

### THE OXYDASES, THEIR PHYSIOLOGIC AND PATHOLOGIC ACTION.

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Saddy, as far back as 1819, observed that certain substances were capable of combining the oxygen of the air with other bodies; he showed that a mixture of water, wheat-flower and resin guaiaci in the presence of air turned blue. Planché, about the same time, recognized, that a number of both animal and vegetable substances turned the fresh tincture of guaiaci blue, as dandelion, mucilage, milk, etc.; he also observed that this reaction disappeared on boiling, concluding that the coloring principle was volatile. These observations were apparently forgotten until Schönbein in 1856, discovered ozone and claimed that the faculty of certain mushrooms and the tissues of a number of plants to blue tincture guaiaci was due to their containing O as ozone and he presupposed the presence of certain bodies which he termed ozonids, having the power of fixing oxygen as ozone and of giving it off to oxidizable bodies. Traube, in 1858, hypothesized the existence of bodies which he called "*sauerstoffübertrager*" which combined feebly with oxygen giving it off to oxidizable substances "*sauerstoffnehmer*" and that to make the reaction more rapid, there was a third body present "*sauerstofferreger*:" there were necessarily two bodies, one capable of combining with free oxygen, the other incapable of combining with free oxygen but capable of combining with it from the first body; it would therefore require a very small quantity of the first body, the "oxydations ferment," to oxidize slowly an indefinite amount of the second body.

Schmiedeberg was the first to prove this experimentally; he introduced into the animal

circulation benzylic alcohol and salicylic aldehyd, and found that the former was transformed into benzoic and the latter into salicylic acids; the transformation he attributed to the presence of an oxidizing substance.

Hikorokuro Joshida, of Tokio, was the first to isolate an active oxidizing principle; he observed that the latex of *Rhus vernicijera* hardened and became black in the air, also that the latex contained urushic acid which was changed into oxyurushic acid under the influence of a substance with diastasic characteristics, and that this transformation did not take place after boiling. G. Bertrand experimented with the juice of *Rhus succedanea* and found that it contained an oxidizable substance; lacol, which under the influence of a diastase, laccase, became black by oxidation, at the same time giving off CO<sub>2</sub>; with laccase, Bertrand was able to oxidize other substances, as hydroquinonin, gallic acid, etc.; he gave the name of oxydases to these soluble oxidizing ferments.

There are several chemical reactions by which these ferments can be identified; the one most commonly used is the bluing of fresh tincture guaiaci; the tincture must be freshly made, as old tinctures may contain hydrogen dioxid, a number of substances decompose dioxids producing the blue reaction with guaiac. Other reagents are guaiacol which turns red (Bourquelot); parephenylene diamin (Rohmann and Spitzer) which turns violet, hydroquinone which changes to quinone and becomes brownish-yellow, giving off a characteristic odor; pyrogallol which becomes brown; ayiosin (Bertrand) which becomes black; phenolphthalein (Rastte and Schedd) which becomes red; benzylic alcohol and salicylic aldehyd already mentioned as changing into benzoic acid and salicylic acid, a reaction which serves to estimate the activity of animal oxydases measuring the amount of O absorbed and of CO<sub>2</sub> liberated. Certain oxidizing substances which are not oxydases give these reactions. Bourquelot differentiates oxydases from the oxidizers not diastasic; he defines oxydases as bodies which "oxidize by means of the atmospheric oxygen to which they give a chemic activity.

Beside the oxidizing ferments proper there are also the indirect oxydising ferments or anaeroxydases (a name preferable to peroxydase which gives the idea of oxidation by dioxid) which do not act on the oxidizable substances without the presence of hydrogen dioxid. Direct oxydases blue tincture guaiaci directly, while the indirect oxydases or anaeroxydases do not except in the presence of H<sub>2</sub>O<sub>2</sub>.

The action of the oxydases is usually accompanied by the absorption of oxygen and the giving off of CO<sub>2</sub>. The following are the essential characteristics of the oxydases: They are not destroyed by their activity. They produce a maximum effect with a minimum quantity. They have a temperature at which they are most active, above or below which their activity is diminished. They are destroyed at 100° C.

In the vegetable kingdom there are a large number of oxydases, as the laccase, the tyrosinase discovered by Bourquelot, 1895, and partially isolated by Bertrand in 1896 which turns certain fungi black by oxidation of the tyrosin they contain, oenoxydase which produces the aging of wines, the maloxydase found in apples, spermasse discovered in barley grains by Gross, olease in olives by Tolemei, oxydin which, according to Boutroux, produces the coloration in brown bread, schonoxydase of Sarthou in the schinus molle. Yeasts and certain bacteria produce oxydases. Dietrich and Liebermeister have recognized the production of an oxidizer by the bacillus of malignant pustule, Roux that *B. coli communis* secreted a pigment produced by an oxydase. In 1899 Roger described to the Academy of Sciences that when *B. coli communis* was cultivated upon artichoke it produced a green coloration which did not appear in other culture mediums nor was it produced by the Eberth bacillus and he attempted to differentiate the two by this means. Lehman, 1902, recognized the formation of tyrosinase by certain bacteria producing a brown color. Many medicinal plants contain oxydases. Bourquelot, 1897, showed the presence of oxydase in gum arabic, in senegal, in myrrh, etc. Vadem found a soluble oxydase in stinking hellebore. Brisse-mort and Joannin, 1898, studied the ferment in digitalis leaves and the berries of bitter sweet. Lepinois, 1899, showed the presence of a ferment in aconite and belladonna. Carles, 1900, in valerian, Aso in tea, Oskar Loew and Lecomte in vanilla.

The study of the oxydases in animal tissues is rendered difficult by the presence in the fluids and tissues of reducing substances which mask the presence of oxydases and perhaps paralyze their action. Whether the oxydases exist in the blood and tissues of living organisms has been much discussed. Schmiedeberg and later Jacquet consider the oxidizing power of the blood as almost *nil*, on the contrary Sal-kowsky and Iamagiwa consider that it is capable of oxidizing, which they proved; they showed that the dried powdered blood was capable of

oxidizing salicylic aldehyd to salicylic acid [at 40°-42° C., their results have been confirmed by Abelous and Biarnes, of Toulouse, and by Bordier; the ferment is contained in the serum and is therefore not hemoglobin, its action is however very weak, they named it globulin oxydase. Paul Tortier localized an oxydase in the leukocyte. Abelous and Biarnes extracted a very active oxydase from carefully desanguinated tissue. Lillie has recently shown that animal cells possess the power of oxidizing and that the faculty rests principally in the nucleus, and Langlois attempted to prove the presence of oxydase in the living blood; he injected intravenously extract of suprarenal, producing an elevation of arterial pressure which remained high much longer in cold than in warm blooded animals, concluding that the blood of a warm blooded animal contained an oxydase capable of destroying suprarenal extract. Oxydases have been searched for in the normal tissues by many physiologists, the thyroid gland appears to contain one of considerable energy. Enriquez and Sicard consider that it plays an important part in the oxidation phenomena associated with the physiologic action of the gland. P. Carnot describes an oxydase in the saliva which according to Linossier and Dupouy is an anaeroxydase. Dastre and Floresco found oxydases in the bile; Lepinois and Abelous in the suprarenal capsule; Cavazzani in the cerebrospinal fluid.

Carnot, Dupouy, Marfan, Gillot, Spolverini have found notable quantities of indirect oxydase in milk and claim that they are of importance to infantile digestion in artificial feeding. Mobecourt and Merklen contend that sterilizing the milk destroys these ferments, which is the reason why boiled milk is not so well borne by the child as fresh milk. A very useful test to find out if milk has been boiled is to add a few drops of tincture guaiaci to a little milk; if it is fresh, a blue color will appear in a minute or two. According to Raoul and Blondell, there are indirect oxydases in the milk serum or whey. Oppenheimer, Rohmann and Spitzer maintain that the glycolytic ferment of the blood is an oxydase; Lepine denies this. Abelous and Biarnes, Pieri and Portier have found oxydase in the hemolymph of the shrimp and Dewitz, Biederman, Gissard in insects, proving that the invertebrates also have oxydases in their organisms.

#### REDUCTASES.

The first reducing diastase was discovered by Ide Rey Pailhade who named it "philothion"

on account of its affinity for sulfur which it reduced to dihydrogen sulfid; according to this author philothion exists in muscle, beef-liver, brain, the small intestine of the sheep, and the white of egg, occurring also in the vegetable kingdom, being formed in the evolutive life of yeast. The existence of philothion is denied by Abelous and Ribaut, they claim that the formation of  $H_2S$  by the extracts of organs alone or on the addition of sulfur is not due to the presence of a diastase but the fact that albuminoid substances if kept at a moderate temperature will give off  $H_2S$  in the presence of sulfur and that this reaction occurs and is in fact accelerated at a temperature of  $125^{\circ} C.$ , which would destroy the activity of a diastase. Other authors admit the existence of philothion, identifying it with another reducing diastase, catalase. (The catalysts must be classified as reductases as they are incapable of oxidizing any substance.) Lepinois was the first to describe catalysts which were more fully studied in the following year by Loew who named them on account of the energy with which they decomposed  $H_2O_2$ . Senter showed the presence of hemtase in the blood which he classified as a reductase. This class of diastase is very abundant in nature; they exist in yeasts, in certain vegetable tissues, the potato (Shaer), tobacco, clover, milk, blood-serum, in the aqueous extract of pancreas, liver, brain, etc. Recently Abelous has come to the conclusion that in the animal organism it is the same ferment which accomplishes both the oxidation and reduction which he calls the oxydoreductor ferment.

#### PHYSIOLOGY.

There are two principal theories regarding the physiology of the oxydases: That they oxidize organic substances (foodstuffs) within the body producing energy; that they oxidize toxins thus protecting the body from autointoxication. According to Duclaux they are the diastases of respiration, causing the blood to take up the atmospheric oxygen more rapidly than it would without their presence.

It is probable that a very large number of biologic reactions are due to the combined action of hydrating and oxidizing ferments. Bourquelot demonstrated that if to a mixture of a few centigrams of emulsion and salacin in solution, he added a small quantity of the oxidizing ferment of *Russia cyanoxantha*, on the second day the odor of salicylic aldehyd could be perceived, showing that first the salicin (glucosid of salicylic alcohol) is broken

down by the emulsin into glucose and salicylic alcohol followed by the action of the oxydase upon the latter, forming salicylic aldehyd. Bourquelot and Gautier consider that analogous reactions take place in the living body; the latter stating that after the hydrolytic action of the ferments upon the albuminoids of the living protoplasm they are oxidized by the oxydases of the blood and the sugar, glycogen, fats, etc., formed into the products for excretion principally  $CO_2$  and  $H_2O$ . Enriquez and Sicard are of opinion that this symbiosis is a condition of normal cell life and is not without its analogue in the symbiosis of the organized ferments which are the determining factors in certain pathologic conditions.

Another question arises: Do the oxydases utilize directly the atmospheric oxygen or are they only able to exercise their power in the presence of  $H_2O_2$  or an analogous dioxid? Some authors contend that dioxids do not exist in the living tissues, others, as Chodat and Bach, consider that the liberated  $O_2$  from oxyhemoglobin does not attack nutritive matter without first being activated which is affected by the division of the  $O_2$  molecule; this splitting of the  $O_2$  molecule is brought about by easily oxidizable bodies which form dioxides in which one of the oxygen atoms is active and acts upon the more difficultly oxidizable bodies with which it comes in contact. These two actions are in accordance with the theory of the presence of direct and indirect oxidizing ferments, the latter deriving their oxygen from dioxids.

The oxydases are also associated with the phenomena of growth. Bertrand, in 1895, showed that the quantity of oxydase in the tissues is in direct relation to the rapidity of its growth; growing organs contain more than those fully developed. These results were confirmed by Abelous and Biarnes and by Springer.

Portier and others consider the oxydases as defenders of the organism; they claim that in an organ wounded so as to destroy cells, the oxydase thus set at liberty forms a cuticle with the substance which makes the trauma by oxidation, which protects the wound against external agents. Chantemesse and Portier have shown that the oxydases figure in the phenomena of phagocytosis and chemiotaxis; as it is a well-proved fact that the oxydases, both animal and vegetable, will destroy toxins both *in vitro* and *in vivo* it is possible that the opsonic phenomenon is due to an oxydase acting detrimentally upon bacteria weakening their resistive power to the phagocyte.

The functions of the reductases are more difficult to elucidate than those of the oxydases; they have a reducing and a hydrolytic power as shown by Abelous and Gerard in their power of reducing nitrates to nitrites and in the hydration of nitrobenzin. Their biologic functions are very obscure. As a very large number of diastases have reversible action, it is possible that it is the same diastase under different conditions which both oxidize and reduce; it must be remembered that the two actions are not absolutely distinct, an oxydase cannot produce oxidation without at the same time causing a reduction, it cannot fix the oxygen of one body to another without taking the oxygen from the air or from a combination of oxygen with some other substance; in the same way a reducer cannot well draw oxygen from one body without oxidizing some other substance with which it is in contact.

#### CHEMICAL COMPOSITION.

The chemical composition of the oxydase has been much discussed but certain very important points have been definitely settled. Bertrand demonstrated that laccase consisted of manganese and an organic substance and that the active portion was manganese; he was able to activate an inactive laccase by the addition of manganese. Trillat has shown that the salts of manganese in the presence of colloids are oxydases, he having prepared an oxydase consisting of an alkaline mixture of mucilage, albuminous matter and a metal, preferably manganese; it appeared as though the organic matter had the power of maintaining the metal in a colloidal condition.

Another theory of the chemic composition of oxydases has been advanced by Bourquelot, viz.: that the oxydases consist of an ozonid and an anaeroxydase. Chodat and Bach believe that the oxydases are albuminoid bodies which combine with the  $O_2$  of the air forming dioxids, the peroxydases augmenting the oxidizing power of the dioxids present which without the peroxydases would be inactive on account of the extreme dilution of the organic solutions in which they have to work. They are of opinion "that the ferments at present known as oxydases are a mixture of oxygenases and peroxydases."

#### METALS IN COLLOIDAL SOLUTION.

Metals appear to play an important role in the activity of the oxydases. Villiers and Livache have shown how manganese by itself will act as an oxidizer, this fact reduces the

importance of the organic portion of the oxydase, but according to G. Bredig, A. Trillat and E. Schaer in order to activate the metal, it must be in a special physical condition, viz., that of a colloid. A colloidal solution is water in which the metal is in metallic condition, not in the form of a salt, and in such a fine state of subdivision that they cannot be seen by the microscope and the solution though colored should be perfectly limpid; such solutions act upon dioxid as catalysers. The colloids have other reactions in common with the oxydases. Substances which have an activating and others which have an inhibitory action on colloids have the same actions upon oxydases; a curve showing the effect of poisons which destroy the action of the oxydases and of colloids is practically the same. If the doses of the poison are minute, on their removal both the oxydase and the colloid will regain their normal activity, but if the doses are large, they lose their power of recuperation.

Colloidal solutions are capable of performing functions the same as ferments, for example the conversion of alcohol into acetic acid by the oxygen of the air can be brought about either by the ferment, *Mycoderma aceti*, or by very finely powdered platinum. According to Hoppe Seyler, Deville, and Debray, calcium formate can be converted into calcium carbonate, carbonic acid, and hydrogen both by the direct action of bacteria and by finely divided metals, as rhodium and irridium. Sulc has shown that dilute solutions of oxalic acid are decomposed in the presence of silver, platinum, palladium in colloidal solution as well as by schyzomycetes. Colloidal solutions are therefore inorganic ferments. To prepare a metallic colloid solution or hydrosol by chemical methods, Bredig placed two threads of the metal he desired to colloid in pure distilled water and passed between the thread ends a voltaic arc of 40 volts and 8 to 12 amperes, an opaque dark colored solution is formed which on filtration is limpid. Faraday, Knaffe, Winckler, Max Muller, Zsygmondy, Schneider, Graham, etc., have made different modifications of this method. Collargal has been shown by Hanriot to be a salt of collargolic acid. These studies of the activities of the metals in colloidal solution are of great interest not only from their biologic chemic standpoint, but as to their possibilities as therapeutic agents.

#### PATHOLOGY OF THE OXYDASES.

Certain pathologic tissues and liquids contain oxydases, pus containing them due to the

presence of leukocytes, their presence perhaps explaining the bactericidal power of the tissues as recently studied by Binaghi in Italy. Authors are not in agreement on the nature of the ferments. Klebs, Vitali, Bruche, Carnot, Brandenburg, admit the presence of direct oxydases; Lenossier, Carriere, Enriquez and Sicard only find anaeroxydase.

Hugounencq and Paviot found direct oxydases in the urine, sputum, ascetic and pleuritic effusions. It would be interesting to study the correlations which exist between certain pathologic conditions and the quantity of oxydase contained in the organs. Bouchard in his "Maladies de la nutrition" attributes the so-called dyscrasias to trouble in the organic chemic exchanges in the tissue. Jacoby attributes gout to the diminution of a special ferment which among other functions oxidizes uric acid, that diabetes is due to a diminution of a glycolytic ferment. Figuer attributes the different varieties of arthritis, diabetes, lithiasis, obesity to a deficient activity of the oxydases. Carriere has shown the diminution of the normal anaeroxydases in the blood in uremia.

#### THE THERAPEUTICS OF OXYDASES, REDUCTASES AND COLLOIDAL METALS.

The application of oxydases, reductases and colloidal metals to therapeutics has been studied by Robin and Bardet who were the first to apply colloidal metals in the treatment of acute affections; their idea was to destroy toxins and to increase organic combustion, thus assisting nature. The experiments of Sieber, Lumiere and Cheviottur showed that the oxydases were powerful antitoxics. Sieber extracted the oxydase from *Scorsonera hispanica* and injected it intravenously into a rabbit, at the same time injecting ten times the lethal dose of diphtheria toxin into the other ear vein; the rabbit remained healthy while the control died in the regular time. I repeated and confirmed these experiments in the Mount Hope Laboratory in 1902 proving that both *in vivo* and *in vitro* the oxydases were powerful antitoxins. Portier showed that oxydases attenuated the power of certain ferments especially trypsin. Dziergowski, Wenchi, and Schoumow have shown that the digestive ferments attenuate the action of both the diphtheric and tetanus toxins; Charrin and Carriere have confirmed these results.

Sieber proved that the oxydases of both animal and vegetable origin attenuated the action of toxins; in the experiments of Abelous and

Biarnes it was the oxydase which destroyed the diphtheria and tetanus toxin. Sieber also showed conclusively that the extracts of the fibrin of a horse strongly immunized against diphtheria, contained oxydase which destroyed not only the diphtheric but also the tetanus toxin, showing that it was not a special body with a special affinity for the toxin against which the animal was immunized, but an antitoxin of more general action. Lumiere and Chevrotier obtained results in destroying microbic toxins by means of artificial oxydases. They prepared a solution of gum arabic, potassium permanganate and a salt of iron, injecting it into guineapigs that had received a lethal dose of tetanus toxin; the animals which received the artificial oxydase survived longer than the controls.

Bourquelot and Marchadier showed that certain toxic substances, as vanillin, are oxidized both by the direct and indirect oxydases. Robin and Bardet deducted from the foregoing experiments that the colloid metals and artificial oxydases favored the hydration and oxid reduction in the human organism and thus checked morbid infections and intoxications and they used solutions of gold, platinum, silver, palladium, manganese, etc., as well as an oxydase of vegetable origin (from beer yeast); they proved that the catalysts have a very interesting physiologic action which is practically the same for all the preparations, oxydase, reductase, colloidal metals, the physiologic serums (lactosermum of Blondel), the therapeutic serums (antidiphtheric serums, etc.), exercise an analogous action, which is due to the fact that they contain traces of metals in a colloidal state and ferments. Baudran recently showed the analogy between the action of artificial serums and the oxydases. Robin gives the following summary of their action:

On nutrition: 1. They augment the urea which may rise 30 percent, this elevation of urea being variable, usually marked in cancer and rachitis. 2. They augment the N coefficient. 3. They augment the elimination of uric acid which may be increased threefold. 4. They elevate the respiratory quotient. 5. They reduce temperature in fevers (Albert Robin, Blondel, Talaman, Barbier). 6. The frequency of the pulse diminishes with the temperature. 7. The metallic hydrosols temporarily raise the vascular tension according to Robin. Blondel finds that lactosermum diminishes it. 8. Chelalier has shown that the metallic colloids are not toxic in fairly large doses.

Robin and Bardet have experimented in different diseases, *scalatina*, grip, typhoid, icterus, pneumonia, etc., and have come to the following conclusions: 1. That metals in a very fine state of division are capable of considerable physiologic action in proportion to the amount of metal employed. 2. That these metals acting in the doses which are at present considered therapeutic, are inactive and useless and have no very marked effect upon the vital chemic processes, but that when better understood will probably take an important place in the therapeutic arsenal. In a case of pneumonia, the administration apparently increased the urinary discharge and brought on the crisis earlier. The physiologic action of these very minute doses of finely divided metals may explain the therapeutics of some of the mineral waters and especially of sea water, which in isotonic strength is of strong physiologic action as shown by Quinton, and is much neglected as a therapeutic agent in his opinion. Heen and Michels consider the mineral waters as being colloidal solutions. Springer believes that the managanese in the decoctions of cereals exerts a favorable action upon nutrition. Robin states that the preparations used contain one hundredth of a milligram per cubic centimeter and that this extreme division of the metals is comparable to the condition of the matter contained in Crooks' tubes; he claims that it is not the specific metal but the radioactive attributes which are the therapeutic agent.

All these remarkable phenomena are due to the physiochemic action of the mineral elements in the cell the result of the alternate dissociation of the atoms of the mineral molecule either in the state of solution as salts or as colloids; in consequence of the dissociation the properties of the primitive metal are completely modified. The salts which enter into the constitution of the cell, potassium, magnesium, phosphoric acid, chlorin, sulfuric acid, are in intimate union with the diastatic element, the solubility being only apparent or partial, and by their composition constitute veritable organized substances.

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## RECENT EDITORIAL OPINIONS.

**The Journal of the American Medical Association.**—**EXPERIMENTAL ARTERIOSCLEROSIS FROM ADRENALIN:** Since the report of Josué in 1903 that rabbits which had received several injections of adrenalin developed marked arteriosclerosis of the large vessels and aorta, much work has been done on this subject with the result that Josué's main contention has been confirmed. There has been however much disagreement concerning the way in which adrenalin causes the vascular lesions and the effects of iodid of potassium and other drugs on their production. Struck by these disagreements Drs. Miles and Johnstone have examined normal rabbits to ascertain if such arterial lesions as they had found in their injected animals were really the result of adrenalin. Of 61 rabbits that had received adrenalin but 17, or 28 percent, showed arteriosclerosis, whereas of 58 supposedly normal rabbits similar lesions were found in 20, or 34.5 percent. A review of the literature, moreover, confirms the statement of Dr. Miles that the positive results so far reported in the literature have not been adequately controlled.—**THE DOCTORATE OF PHILOSOPHY IN THE MEDICAL SCIENCES:** Interest is being aroused in the establishment in the best equipped universities of courses leading to the degree of doctor of philosophy in the special branches of medical science. This is being done to bring about a better and more thorough preparation of the specialist in the particular branch he is to follow. Every-

where in the country colleges and universities are establishing chairs in the fundamental medical sciences creating a demand for men with a university training to fill them. So that it is worth the while for young men to prepare themselves for them and the number of doctorates in the fundamental sciences of medicine will increase in direct proportion to the inducements offered to men to receive the training this degree implies.

### **The Boston Medical and Surgical Journal.**

—**THE DEVELOPMENT OF THE GRADUATE SCHOOL:** The function of the medical school is rapidly coming to be much more than the education of the individual student for the practise of his profession.\* In the interests of a broader medical knowledge, advance is being made in the establishment of graduate courses for educating physicians in active practice. Clinical courses so far have been especially emphasized, and it is regrettable that physicians who are unable to carry out investigations themselves should be cut off from the possibility of learning at first hand the results of other investigations and their bearing on the general problems of clinical medicine.

**Medical Record.**—**THE DIAGNOSTIC VALUE OF LOCAL TUBERCULIN REACTIONS:** The discovery of von Pirquet of the diagnostic value of tuberculin vaccinations has been more or less confirmed by many experimentors in France, Italy and Germany. Von Pirquet regards the test as harmless and as infallible at least in young children though others have not obtained the reaction in all cases of undoubted tuberculosis. A modification of this cuti-reaction has been suggested by Wolff-Eisner—the instillation of a 1:100 solution of tuberculin into the conjunctival sac. This method has been tested by many investigators most of whom come to the conclusion that while the absence of the ophthlmo-reaction did not negative tuberculosis, its presence afforded positive evidence of the disease. This test is simple in application, apparently harmless, can be applied in dispensary as well as in hospital practice, is not influenced by the presence or absence of fever and cannot possibly aggravate the general or local phenomena of tuberculosis. The method of von Pirquet seems to be less reliable.—**BIER'S HYPEREMIA IN ACUTE ARTICULAR RHEUMATISM:** E. Steinitz has recently compared the results of one year's hyperemia treatment of acute articular rheumatism with one year's salicylate treatment as carried out in hospital wards. He used a bandage to produce hyperemia and applied it

twice a day for two or three hours. Of 75 patients treated with salicylates 94.7 percent were discharged cured, 39 percent before the tenth day and 65 percent before the twentieth. Of 64 patients treated with hyperemia 98.5 percent were discharged cured, 48 percent before the tenth day and 80 percent before the twentieth day, but in 16 out of the 64 salicylates were also given because the improvement was not rapid enough by the sixth day. Steinitz believes that hyperemia should always be tried first unless contraindications exist. When hyperemia has had little or no effect after five days' treatment, salicylates should be used either alone or in conjunction with hyperemia; in the latter case smaller doses of the drug will suffice.—**A NEW DIAGNOSTIC SIGN IN TYPHOID FEVER:** Chantemesse has recently reported favorably on the ophthalmoreaction as a method of diagnosis in typhoid fever. He instills one drop of a solution of the typhoid toxin into the inferior cul-de-sac of the eye. A redness of the conjunctiva with some lachrymation results which in persons not suffering from typhoid disappears in a comparatively short time, while in those with typhoid fever the reaction is much more marked and persists for a longer period. The method is apparently devoid of danger and is of definite diagnostic import. Chantemesse has obtained a positive reaction in a rabbit forty-eight hours after a subcutaneous injection of a typhoid culture, so the method may displace either the diazo reaction or the Widal test in the early diagnosis of typhoid fever.—**THE APPENDICES EPIPOLOÆ:** Riedel was the first to call attention to the surgical importance of these appendages of the large intestine. Disease of the appendices epiploicæ has so far been observed only in middle or advanced age and especially in persons suffering from obesity. Twisting on their longitudinal axis, a pedicle is gradually formed and degeneration of the distal portion takes place. Finally circulatory disorders result and inflammatory adhesions of the distal portion to the parietal peritoneum, the mesentery, or intestinal loops may form. The adhesions may then give rise to intestinal strangulation or the body may be found free in the abdominal cavity or in hernias, especially on the left side.—**RELATION OF THE HEIGHT OF THE ARCH TO THE FUNCTIONS OF THE FOOT:** For the condition usually known as flatfoot, the term weak foot as proposed by Whitman is a far better one. It is still the common opinion that the height of the longitudinal arch is of value in estimat-

ing the strength and usefulness of the foot but statistics recently published by Hoffman prove this view to be wrong. His investigations show that there is an almost constant relation between the extent of the impression of the foot as obtained on smoked paper and the height of the arch. He also found that the height of the arch had no relation whatever with the symptoms of weakness of the foot and that it was no criterion for the usefulness of the foot. So that the impression records of the longitudinal arch commonly made by surgeons are of no value in the diagnosis of weak foot.—**THE POSSIBLE DANGERS OF SALINE INJECTIONS:** It has long been recognized that the intravenous injection of physiological salt solution is by no means the indifferent procedure it was at first considered. Rössle notes a macroscopic cloudy swelling of the cardiac muscle together with poor contraction and a friable consistency, though no microscopic evidence of parenchymatous degeneration is to be discovered. The procedure appears to be unsuited for use purely as a cardiac stimulant and to be not free from danger when the kidneys are incompetent while observation of the fundamental rules in regard to accuracy in making the solution, and keeping it at the required temperature, slowness of flow into the vein and administration of only small amounts at a time is absolutely necessary.—**THE MODE OF INFECTION IN PULMONARY TUBERCULOSIS:** Pfeiffer and Friedberger have recently described a series of tests bearing on this problem. As a result of these, out of 28 guineapigs that received tubercle bacilli by stomach-tube, 21 when killed at the end of 50 days showed no tuberculous lesions whatever and only four had pulmonary lesions. Twenty-nine other guineapigs were made to inhale the germs in much smaller amounts and of these 22 manifested pulmonary tuberculosis. These results are in harmony with Flüge's dictum that in guineapigs inhalation is a much more potent means of tuberculous infection than ingestion of the germs through the alimentary tract. They also furnish a good argument for those who hold that the practically important means of transmission in man is through inhalation and not through food.—**BLOOD CULTURES IN TYPHOID FEVER:** Of the many advances made in the prevention of this disease probably none are so important as the methods for early diagnosis. Of these blood cultures now stand in the front rank. Padlevsky recently gave his experience with the use of bile to enrich the culture

medium as recommended by Conradi and Kayser. In 119 cases examined positive results were obtained in the first week in 92.3 percent, in the second week in 72.4 percent, in the third week in 66.6 percent and in 33.33 percent in the fourth week. Of greater interest is the original work of Klodnitsky who claims that it is not the enriching of the media by such elements as bile, peptone, etc., that leads to the growth of bacteria, but the destruction of the red blood-corpuscles and the abolition of such bactericidal properties as these formed elements of the blood may possess. He simply mixed the blood with sterile water, using this as the first medium because of the hemolysis thus produced. Cultures were obtained in 73 percent of the 100 cases of typhoid fever examined. The work was done under great difficulties so that with better surroundings the method should compare favorably with other methods.—PRIMARY TYPH-LITIS: The question whether such a condition exists independently of similar involvement of the vermiform appendix is a doubtful one. From the conditions present in a case reported recently by McWilliams, in conjunction with a study of the literature of the subject, the conclusion is reached that primary, acute and chronic typhlitis does occur independently of appendicitis, dysentery, tuberculosis, actinomycosis or carcinoma and may be idiopathic in origin or depend upon coprostasis. The condition may lead to perforation with the formation of perityphlitic abscess or general peritonitis. The symptoms and indications for operation are similar to those of appendicitis.

**New York Medical Journal.**—NATURE CURES AND NATURE CURISTS: Nature's gifts, water, air and sunlight, have from the earliest times been used in the treatment of diseases. In modern times we find three men standing out as prominent nature curists. Prissnitz was an advocate of the water cure. He was born in Austrian Silesia in 1799 and died in 1851. Physicians have modified and scientifically applied his teachings to the treatment of various disorders. Kneipp was born in Bavaria in 1821 and died in 1897. He changed the water cure and added to it the walking in bare feet through wet grass and also used herbs and their infusions. The medical profession obtained very little help from his theories. The third is a Swiss, Arnold Rikli, born in 1823 and died in 1906. He is the rediscoverer of light and air as a specific treatment, and invented the steam bath. He had many followers who changed and modified his teachings

for practical use.—EXCESSIVE SUSCEPTIBILITY AND IMMUNITY: Rosenau and Anderson have previously shown that while horse serum is harmless when injected into a normal guineapig, a subsequent injection may produce symptoms which may produce death. This reaction is of utmost importance as related to the antitoxin treatment of diphtheria. The authors' further work indicates that hypersusceptibility is either the essential element or one stage in the process of resistance to a certain class of diseases. Hypersusceptibility may easily be induced in guineapigs with proteid extracts obtained from bacterial cells, the first injection seeming to be comparatively harmless while the second injection may be followed by symptoms leading to death or in certain cases by an immunity to the corresponding infection. These results may give a possible explanation for the period of incubation of some of the communicable diseases, inasmuch as the period of incubation in a number of these diseases, 10 to 14 days, corresponds with the time required to sensitize animals with a strange proteid.

**The St. Paul Medical Journal.**—A SIMPLE METHOD FOR THE PREVENTION OF POSTOPERATIVE VOMITING: Acting on the theory that postoperative vomiting is caused by an irritation of the gastric mucous membrane produced by the copious salivary secretion mixed with ether which trickles down into the stomach during operation, Mac Arthur of Winnipeg conceived the idea of having the stomach full of water at the time of operation and by diluting the saliva and ether to lessen the irritation of the mucous membrane and so prevent vomiting. In nearly all of 35 different operations in which this was tried there was a complete absence of vomiting. The intense thirst and retching were absent and the odor of the anesthetic was much more quickly eliminated from the system. The method should commend itself to all surgeons.

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## NEWS AND NOTES.

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**Practising Without License.**—Assistant Health Commissioner William B. Winn, St. Louis, has filed charges against six physicians on charges ranging from misdemeanor to felony. He states that there are about 75 physicians in the city practising without a license. Some of these, he says, are not registered, but hold certificates under the names of physicians who have been dead for several years.

# American Medicine <sup>667</sup>

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The "Aid" of the American Medical Association to Medical Libraries.—About ten years ago the American Medical Association, at that time interested in professional helpfulness; agreed to send its *Journal gratis* to the members of the Association of Medical Librarians. Later somebody reversed the order and the "aid." Who? The librarians, in June, 1907, through Dr. Jacobi, succeeded in getting the House of Delegates to instruct the Board of Trustees to restore the American Medical Association's *Journal* to the free mailing list of the Library-Members. The Secretary of the American Medical Association, instead of complying, asked a lot of impertinent, let us rather say, nonpertinent questions of the librarians; to which pertinent answers were given. "And here," says the Secretary of the Librarians, "the matter rests. Nothing further has been heard from Dr. Simmons or his Board of Trustees in reference to the matter." In the formation of the Librarians' Association the gift of their journals to the librarians was solicited of all medical publishers. It was found that those who complied with the request were those publishers alone who published journals owned or controlled by the profession, or edited for its benefit. No journal published only for the pecuniary benefit of the publisher or editor, was given to the librarians. We have said above that at a time in its history the *Journal of the Amer-*

*ican Medical Association* was taken from the free mailing list of the Librarians' Association. Who knows why?

The Editor of the *Journal of the American Medical Association*, replying to our recent criticism of its action (or inaction) in its "aid" (or nonaid) to libraries, says that it need not and should not notice criticism coming from a journal with such a small circulation as ours. He then proceeds to notice it in a characteristic answer two columns in length. Why does the editor not mention the name of the journal (our own) in which he is criticized and state what its "small circulation" actually is? And why is criticism "not worth while to notice" when the journal in which it appears has such a contemptibly small circulation? The brute force of numbers is that only which is "worth his while." So far have we come in medical journalism, and what makes it worthy of a great man's noticing! "Upon what meat doth this our Cæsar feed?" Upon the meat, patently of large circulation. The editor complains bitterly of the existence of enemies everywhere of His Association. One of his hired editorial writers might be set to work asking why it is His Association. And there might appropriately be set forth why so much hatred keeps cropping up. But he should secure a writer who can write sentences in something remotely resembling

correct English; with a desire to be truthful; with some approach to logical statement; with a little knowledge of facts; and, most desirable, "without the sounding of trumpets" to be likened only to a delightful braying from over the fence. The editor assures us he hates the sounding of trumpets and loves quietness. *Similia similibus* was once his motto. Does it so remain?

**Overcrowded dairy farms and tuberculosis** have not often been mentioned in the present milk agitation, but it is time to take up this side of the matter. It is an axiom of biology that, in every species of living organism, there is a maximum number of individuals which can exist on a given area. It is not necessarily limited by the food supply, but by self-poisonings and contagious diseases. Often the maximum is far less than the number which can find food. When food can be imported, as in the dairy farms, there is a constant temptation to overstock. The ground and buildings become infected and the herds are ruined. The agriculturist grows better plants and makes more money by thinning out. The coffee industry was ruined in the Philippines and Ceylon through diseases spread by crowding the tree, but success is following the opposite policy. Dairy farmers should learn this lesson and perhaps we would then hear of fewer tuberculous herds.

**What is Overcrowding?**—Since it is a question of public health, perhaps it would be wise to determine what is overcrowding and then regulate the matter by law. It is certainly a public menace to keep a large herd in a small field, or small barn yard, constantly trampling in their own excreta and filthy beyond words. To be sure milk is very scarce now, and with the increasing density of city populations, it may become

a matter of extreme difficulty to supply it unless from very long distances. Modern transportation and cold storage are rapidly reducing the necessity of bunching the milk cattle near cities. If the conditions demand overpopulated farms, then perhaps a solution may be found in a system of drainage and removal of excreta similar to the complicated plumbing of a city. As the expense may be prohibitive, the only course to pursue is to spread out the farms over greater areas to reduce overcrowding. Something must be done, for the diseases of the crowded herds are likely to become a serious matter.

**The opposition of dairymen** is the serious obstacle at present. In more than one part of the country they are combining to resist sanitary reforms demanded by health authorities, and in one place the president of the dairymen's association advised farmers to drive every sanitary inspector from their premises. This is a dreadful state of affairs and it has suggested the plan of extending the authority of municipal health boards beyond city limits, as in the case of water-supplies. In the case of milk sent from one State to another it has been suggested that the whole matter be placed under federal control under the provisions of the pure food laws, as it is interstate commerce. It is merely another instance which shows that the consumers in self protection must control the producers and dealers who are causing sickness and death.

**The pasteurization of municipal milk supplies** is under consideration, partly on account of the difficulty, if not impossibility, of soon securing uncontaminated milk by any proposed system of inspection, except possibly in the smaller cities. The question of expense does not enter, because it is quite probable that the increased cost due to pasteurization is about equal to that of making

dairy farms "model." Unfortunately health officers differ radically as to the wisdom and even the benefit of pasteurization, but it seems that the differences of opinion can be reconciled as they are due to different viewpoints. It is a waste of time and space to detail the proofs that pasteurization does destroy all or nearly all pathogenic organisms which may be accidentally introduced even under the best attainable system of dairy management. That it destroys the digestibility of the milk, or induces scurvy, rickets and disorders of nutrition, has been asserted and strenuously denied. The vast majority of the medical profession would no doubt vote for measures which secure a milk which does not need sterilization or pasteurization, but which can be given raw after proper modification. This ideal is far off in the larger cities whose milk comes from long distances—one or two hundred miles or more. The advocates of pasteurization advance the argument that to a large extent it is a temporary expedient until the ideal can be obtained—though, to be sure, there are a few who believe that it will always be necessary. A recent discussion of the problem at the New York Academy of Medicine was quite disappointing on account of the differences of opinion.

**Misconceptions of the value of pasteurization** are prevalent both in and out of the profession. It is believed here and there that it actually removes contamination and will obviate the necessity for dairy cleanliness. There are many laymen who would be perfectly content with a sterilized dirty milk, just as there are many who are content with a filtered water which is merely dilute sewage. In addition pasteurization is an exact process which cannot be trusted in the hands of the dairyman. There are reports of some samples which were bac-

terially worse than raw milk, probably because less care was given to cleanliness, the milk was not promptly cooled. It is known that pasteurized milk requires greater care than the raw if it is to be kept fresh. It does seem to be more of a process for experts—either in the laboratory or trained in the home. Still it must be left an open question for prolonged discussion, particularly as it is asserted that commercial pasteurization merely enables the dirty dairy-men to keep the milk from souring until it is sold.

**Exaggeration of the dangers of infected milk** is the inevitable consequence of these discussions. There is no question of the fact that bad milk does cause a dreadful summer infantile mortality, from intestinal diseases, but the idea has been advanced that a proper milk would stop it all, whereas a small percentage is found even in breast-fed infants. Though it seems reasonably proved that tuberculosis can be transmitted by milk, it has also been shown, as a matter of fact, that infantile tuberculosis of the intestines is very rare—almost a curiosity—and that infants are generally infected by some member of the family and die of tuberculous meningitis or tuberculosis of the lungs. Similarly typhoid fever, diphtheria and scarlet fever epidemics have undoubtedly been traced time and again to the milk, yet the great majority of the cases are contracted otherwise. A pure milk supply will, therefore, prevent much sickness and very many deaths, but will not reduce the mortality more than a small percentage of the present total. In the efforts to improve conditions it is wisest to stick to the facts and not exaggerate, for the reaction only creates public apathy. The lives now lost may not be a large percentage, but are great in numbers,

and it is dreadful to permit such preventable mortality.

**Milk reform is a slow evolution** which constantly approaches an ever-rising ideal which may not be reached for a very long time. It does seem that the wisest course is to stir up public sentiment to the end that health authorities will be supported in their ever-increasing control of the situation. As we have previously stated, it is only 50 years since attention has been directed to the matter, and it is only 30 years since the city health authorities have taken it up. Very much progress has been made, but there is no reason to doubt that the next 30 years will witness a vastly greater improvement. As it will be expensive, we should not begrudge an extra cent or two per quart—the total will be but a fraction of what is spent monthly on useless luxuries.

**The chewers of Yale** are evolving the art of chewing to perfection. Certain experiments have been carried out, the subjects choosing food they craved, but being merely required to masticate it thoroughly. From the way the amounts consumed fell off—25 percent—it is quite evident that the new art is an appetite destroyer. Chewing is one of the involuntary acts—to make it voluntary reverses matters. No wonder some of the men lost weight and some lost strength. But they improved wonderfully in endurance and in mental and physical vigor. The new alleged natural law, of the less fuel the more energy, should save millions to the steamship companies and railroads. It is not said that the men were cured of their corns and bunions, but from the enthusiastic accounts of their wonderful condition, we would almost expect a cure of hare-lip. It may have been a highly scientific observation, but it was unhygienic, as it violates instinct.

**What is Proper Mastication?—**Men cannot bolt food like dogs, but the necessity for prolonged chewing like a cow is not proved. All children tend to bolt their food and are they acting unnaturally? Babies are generally brutally natural in all things. From the structure of the teeth and the shape of the articulations of the jaw, man is not able to grind his food to small bits, but all he can do is to crush it, and that is about all he attempts. Swallowing is involuntary and occurs as soon as the crushing is fairly done. It has even been stated that if meat is thoroughly chewed it is alkalized by the saliva and its digestion is unduly delayed by the extra time taken for it to become acidified by the gastric juice. The Yale experiments and the whole matter of Fletcherism are based upon a false hypothesis of our necessities. There is no proof that this cult is the cause of the heralded alleged wonders it has accomplished. It is merely one of the legion of fads and it is rather painful to see it so exalted in universities. But, then, universities do queer things nowadays.

**The proper diet for the tropics** seems to be better understood by laymen than by physicians. It has long been an article of medical faith that the white man in the tropics should reduce his diet to a minimum, cutting out the meats and subsisting on fruits like the half-starved enervated natives who can neither work nor resist disease because they are fed below their factor of safety. Indeed an army surgeon was awarded a prize for an essay advocating reduction of the soldier's tropical ration and in spite of the fact that the British were compelled to increase the meat ration in India. Dr. Wiley, the government food expert, at a discussion of diet in New York, a year or two ago, likewise advocated a minimum diet for the

tropics, though it has long been known that such climates subject a northern man to extra strains for which he needs extra nourishment, or he will go under through exhaustion or the infections.

**Sensible feeding experiments at Panama** are said to be solving the labor problem. It was discovered that the healthiest negroes were the well-fed prisoners in the jails, and that those fed as Wiley and the others advocated were sickly and could not work. So the proper diet was supplied by the official mess kitchens and the transformation is said to be marvelous—one writer believing that without this generous feeding the canal cannot be built. The man who has made this scientific discovery is simply Mr. Smith. If he were a doctor, imbued with Yale and official orthodox ideas, he would not have been so sensible. All honor to Smith! The medical profession will relinquish its foolish ideas on tropical foods about the time the canal is finished by well-nourished laborers. If a man wants to stand the tropics, he must eat more than enough for the purpose, so as to be well nourished and carry a surplus for emergencies. If current medical ideas are adopted, the canal will never be built. There are some charges against the commissary department, but they relate mostly to lack of means of keeping meats fresh—that is, not feeding enough. The matter will no doubt be remedied soon, but the faultfinders should remember that the medical profession has recommended a low dietary, and it is a grand thing to have these theories disproved, even if a little beef now and then is spoiled.

**Quackery in the Asiatic antiopium crusade** is a rather startling thought, but quite natural after all. Without minimiz-

ing the dangers of opium for the white races, it is safe to assert that for orientals it is not nearly so bad as it is painted. The crusade of the missionaries has taken on the tone of fanaticism and assertions are made which do not bear analysis. It was to be expected that some drug would be found to cure the habit—and the expected has happened. It is reported<sup>1</sup> that a certain climbing plant (*combretum sundaiucm*) is the Providential agent. An infusion of the dried and roasted leaves has cured untold thousands in a few weeks—as though such a habit as opium eating, involving profound changes in the nervous system, will yield to magic so promptly. It is evidently an ordinary quackish swindle, and a pity that the Chinese and Malays should be victimized this way by higher races. We are interested in the opium problem in the Philippines and a rather hopeless one, too. There is considerable doubt that the habit can be prevented, and much more doubt as to cure.

**The cocain habit at home** is a far more serious matter and one which better deserves our attention. It is reported to be increasing at an alarming rate. From the available evidence it is safe to state that this drug causes cerebral changes so profound that the oriental opium eater in comparison appears to be unharmed. It has been asserted that the cocain habit is rarely cured, and even if it is cured, the cerebral changes induced are permanent. It might be unwise to state that asylums are filling up with its victims, but the total of wrecked lives is no doubt appalling. Worse than all else, is the dearth of practicable suggestions for preventing the sale of the drug or for the reformation of the victims. Perhaps its sale

<sup>1</sup> Consular Reports, July, 1907.

might be absolutely prohibited by law except on a physician's prescription, and physicians compelled to file a copy of each prescription with a court of record and be prepared to defend their use of it.

**The indiscriminate use of cocain** in nasal diseases has happily ended, and the body of the profession is fully aware of the possible consequences of using it even once. As with morphin, the legitimate uses are now quite sharply circumscribed, and it is rarely if ever placed in the patient's possession. Patent medicines are probably responsible for the present number of victims, and it is perhaps possible to forbid their sale. The pure food law will be of great assistance in checking the evil, but there is room for a lot of earnest work by those interested in public health and the prevention of degradation. The work has already begun in the State Legislatures and it deserves every encouragement. It is said that through patent medicines the negroes of the South are becoming cocain victims at an alarming rate.

**The impudence of quacks** is proverbial, indeed it is their stock in trade. They are quick to take up every new subject and adroitly turn it to advantage in defrauding their poor dupes. The exposures of the men who sold salt water for radium at \$2,000 an ounce is but a mere incident of the business. It was to be expected that they would keep in touch with the present warfare upon them—it was self-preservation for them to utilize it if they could. It was also known that every phase of the matter would be twisted into favorable shape, though it was expected that the stereotyped cry of persecution through jealousy would be heard more frequently. It is not at all strange, therefore, that commendations of

patented mixtures whose composition can be learned, would be advertised as the endorsement of every wretched fraud in the country. It now appears that the present attitude of progressive physicians to use certain known combinations of value, is also adroitly managed to serve as an endorsement of a notorious quack. It is quite evident that the crusade is bearing good fruit and that the business of living on the credulity of sick people and of swindling the helpless has been given a serious blow. We wish a continued success to the warfare against the great American fraud—the quack.

**The antinoise crusade** shows commendable progress, but it is a bright commentary upon this utilitarian age, that the greatest advance should not be on the ground of interference with health, but of interference with commerce. In this we are true Anglo-Saxons. There has been such suffering from the unnecessary use of boat whistles that efforts were made to limit the nuisance, but they were unsuccessful until it was shown that indiscriminate whistling confused the signals of boats as to their course. Then the United States harbor authorities ordered the cessation of the unnecessary whistling in all our ports. It is now reported that Congress has passed a law to this effect. Thus it goes. If we wish to make an improvement in sanitation, the quickest and surest way is to prove that it is cheaper. Life and health are apparently of less value than dollars. Even in great works, like water-supplies, sanitarians frequently stoop to figures showing the money value of the lives saved to the State, to prove that sanitation is a profitable investment. This should not be necessary and in time it will not—that is, when the people learn that discomfort, disease and death are invariably more expen-

sive than comfort, health and life. The anti-noise crusade tends to increase public health, whether or not it enhances trade.

**Municipal Laws as to Noises.**—It is a satisfaction to know that the general laws as to nuisances cover the case of noise, and that each city also has more or less law specifically mentioning noises. It seems that a due enforcement of law will correct much if not all of the present evil, and we are glad to see one police department taking it up in earnest. The main efforts are directed to the vicinity of hospitals, but the healthy also are entitled to protection. It is dawning upon the public that noise is not inseparable from business, except in a few instances like boiler making. Indeed noise positively hinders business. These new ideas also will in time work to the betterment of public health. In the meantime let the law of nuisance be invoked at once. If it is not effective and more specific law is needed, make it. The police can do much now if they would. Even the leather-lunged newsboy should be checked, and the Fourth of July made sane. One fatality of our last Fourth is said to be due to shock from the noise of a giant cracker, and the sufferings of nervous people are always very acute on that day.

**A fatality due to the antinoise regulations** is reported from Chicago, a man having been run down by a locomotive which could not ring its bell or blow its whistle by reason of the proximity of a hospital. It was asked how far the well are to be jeopardized for the benefit of the sick. It apparently did not occur to the questioner that such an accident is due to defective railroad management whose duty is to remove dangers instead of depending on noise to warn people of them.

**The cause of criminality** is again brought up for comment by some dreadful statistics from the Iowa penitentiary at Anamosa, relative to the nativity and home life of 341 inmates. The report shows that 86 percent are native born, and two-thirds of these have native born parents. Only 13 percent were in poor health. The home life was bad in only two cases, though unhappy in 17, the character of the father was bad in but two cases, and drunken in but 28, all the mothers were of good character and temperate, two of the fathers had been delinquent, the parents had been divorced in but one case, only seven of the fathers and six of the mothers were illiterate.

**Are the "best people" filling the prisons with their children?** It looks so—at least in Iowa. To be sure, 20 percent of these criminals had lost the father before they were 15 years of age, 20 percent had lost the mother, and 30 percent left home before they were 15 years old, so that at least half had not the full benefit of home life at the critical period from 15 to 21. Making due allowance for all that, it does seem that too many parents permit their children to drift into crime or that the children are mental weaklings, or rather moral weaklings—badly born. Or is the climate of Iowa unfit for permanent residence, and does it cause a degeneration not noticeable in the immigrant until the third or fourth generation? If sterilization is to be practised to prevent criminality, it is evident that it must be practised in the best families—not in the worst. It is evidently not an hereditary matter at all, but an acquirement, and we do hope that Warden Hunter will follow up his excellent statistics and now tell us why each case became a criminal, if so many of them were well born.

## BOOK REVIEWS.

**Treatment of the Diseases of Children.**—By CHARLES GILMORE KERLEY, M.D. W. B. Saunders Company, Philadelphia and London, 1907.

This book differs from most works on diseases of children in dealing with their treatment exclusively. It recognizes the fact that this treatment must be upon different lines than in adults—a point which is often overlooked in other books on pediatrics. Dr. Kerley's book is intended for the general practitioner rather than the specialist; hence, the various lines of treatment are described in all their details. A further advantage lies in the fact that these details are based upon the author's actual experience in private and hospital practice. An example of the thoroughness of the book is found in the section on infant feeding, where methods are given which are applicable to the poorer classes, who have neither the money, time or knowledge necessary for the application of the usually described percentage methods. At the end of the book there are valuable and unusual articles on temperature in children, vaccination, care during the summer months, drug dosage, and therapeutic measures, including a most useful section on gymnastic therapeutics. The text throughout is interspersed with useful prescriptions and illustrative cases. Among the many books on diseases of children that have made their appearance within recent years, we would recommend Dr. Kerley's work as being of the greatest practical value.

**A System of Medicine.**—Edited by THOMAS CLIFFORD ALLBUTT, M.A., M.D., LL.D., F.R.C.P., F.R.S., F.L.S., F.S.A., and HUMPHRY DAVY ROLLESTON, M.A., M.D., F.R.C.P. Volume III. The Macmillan Company, New York. Price \$5.00 net.

As the second volume of this admirable System of Medicine was divided into two parts, each approximating in size the book before us, the latter might, with propriety, be called the fourth of the series. It is devoted to a consideration of Diseases of Obscure Origin including Rheumatoid Arthritis, Osteoarthritis, Spondylitis Deformans, the Articular Lesions of Infective Diseases, Intermittent Hydrarthrosis, Pulmonary Osteoarthropathy, Osteitis Deformans, McIlities Ossium, Rickets, Achondroplasia, Gout, Diabetes, Sea-sickness and Mountain-sickness, and second, Diseases of the Alimentary Canal, and third, Diseases of the Peritoneum. Professor Allbutt contributes the articles on Mountain-sickness, Neuroses of the Stomach and other Parts of the Abdomen, and Dilatation of the Stomach. Dr. Rolleston has written the articles on Diseases of the Esophagus and Diseases of the Small Intestine. The other contributors are men of rec-

ognized position entitled to speak with authority. Garrod's articles on Rheumatoid Arthritis and Osteoid Arthritis are essentially new as are also the articles on Pulmonary Osteoarthropathy and Achondroplasia. Professor J. Rose Bradford has revised the articles on Gout and Diabetes, originally contributed by Sir William Roberts (deceased) and the late Dr. Ralfe respectively. The articles on Ulcer of the Stomach and Ulcer of the Duodenum by the late Professor Dreschfeld are admirable examples of lucid presentation and careful clinical consideration which characterize the writings of the distinguished observer. The present volume maintains the reputation of its predecessors as a part of the best System of Medicine that has appeared in the English language. It is especially to be commended as a model of book-making for, while containing upward of 1,000 pages it is light, easily handled, contrasting strongly with the bulky, heavy, unwieldy volumes commonly submitted by the present day publishers.

**Diseases of the Intestines and Peritoneum.**—

By PROFESSOR DR. HERMANN NOTHNAGEL. Edited with additions, by H. D. ROLLESTON, M.A., M.D., F.R.C.P. Second edition, thoroughly revised. Authorized translation from the German, under the editorial supervision of ALFRED STENGEL, M.D. W. B. Saunders Company, Philadelphia and London, 1907. Price \$5.00.

An opportunity to revise a translated work that appeared three years previously does not often constitute a part of the good fortune of an editor. Dr. Rolleston has fully availed himself of this opportunity. In a number of places editorial additions of highest importance and of considerable length have been interpolated; there is scarcely a page to which the editor has not made some contribution. The article by Dr. Fritz Obermayer on chemic processes that occur in the intestine is followed by Professor Manaberg's contribution on the bacteria of the intestine. The same author discusses the movements of the intestine and illustrates the subject by fairly enlightening plates. Dr. Rolleston adds an article on intestinal sand. The original exposition on the urine in diseases of the intestine has been amplified by the editorial addition of the work by Herter, Pearce Gould, von Noorden, Cammidge, and others. Various types of intestinal ulceration are fully discussed, even including the rarer form such as amyloid, and thrombotic and embolic ulcers. Upward of 50 pages are devoted to discussion of stenosis and occlusion of the intestine. It is not quite apparent why the author defers for 60 pages discussion of internal stricture of the intestine, tuberculous stenosis, constriction by adhesions, and internal obturation of the organ—all of which are very fully discussed. The article on invagination of the intestine edited by Mr. D'Arcy, is especially to be commended.

That portion of the volume devoted to diseases

of the peritoneum deals with the physiology of this structure, the various forms of dropsy and ascites, peritonitis (very fully), subphrenic abscess and tumors of the peritoneum. While the consideration of appendicitis is clear and full, American specialists will be mortified to find the disease described under the head of acute circumscribed peritonitis, and nosologically submerged to the level of subphrenic abscess, abscess of the greater omentum, and other rare forms of circumscribed peritoneal abscess. The volume closes with a bibliography of 25 pages arranged alphabetically; the editorial references are given as footnotes.

**Gynecology and Abdominal Surgery.**—Edited by HOWARD A. KELLY, M.D., F. R. C. S. (Hon. Edin.), and CHARLES P. NOBLE, M.D. W. B. Saunders Company, Philadelphia, and London. Volume I, 1907.

In glancing over the list of contributors to this work, we are at once impressed with the names of writers whose reputation in gynecologic works has long since been established. Edebohl, Clark, Kelly, Noble and Webster are a few of the distinguished men whose contributions appear within the covers of this volume. With such an introduction and two authoritative editors, we can well realize the character of its contents. The importance of treating the two subjects as a whole cannot be disputed when it is considered that the gynecologist must naturally be an abdominal surgeon.

Volume I treats principally of the diseases of the female pelvic organs. The chapter on gynecology written by Noble and Anspach will be found of the greatest value to the general practitioner. It is he who first and foremost must diagnose and treat the conditions before their arrival in the hands of the specialist and also treat them after their departure from the hands of the surgeon. The medical aspect of all gynecologic conditions is given due space in over 100 pages. The introductory pages on gynecologic technic are clearly written, very practical and profusely illustrated. The bacteriology and pathology of the reproductive organs in the female are considered in two chapters and without doubt have not found their equal in arrangement, illustration, practical detail and easy reference. This feature is very different from most works on the subject. The operations described in various chapters contain intricate detail, clear phraseology, and are the latest and most satisfactory procedures used at the time of publication. The volume is neatly bound, and contains over 800 pages. The type is of fair size and the quality of paper excellent, all of which is most creditable to the publishers. Especial commendation is due Herman Becker and Max Brödel for their beautiful as well as practical illustrations which are numerous throughout the volume. The work, when completed, will undoubtedly rank high as a standard on gynecology and abdominal surgery.

## CORRESPONDENCE.

### HYPOTHESIS CONCERNING SOUL SUBSTANCE..

BY  
AUGUSTUS P. CLARKE, M. D.,  
of Cambridge, Mass.

*To the Editor of American Medicine.*—In the July number of *American Medicine*, Dr. Macdougall replies to my criticism in the May number on his article "Hypothesis Concerning Soul Substance," as published in the April issue. Dr. Macdougall says "practically all of my patients passed away in a state of profound asthenia, with progressive respiratory and circulatory failure, with the cold, clammy skin, and the cold, feeble stream of respiratory air, so common, in those dying of long, protracted, chronic tuberculosis." With this additional record of the author before me, it seems amazing that he had not taken the internal and external temperature, just before and at the time of death. Especially, when he was endeavoring to account for the difference in weight, just before and at the time of death, which in one case was about three-fourths ounce. He does not consider that a sudden rise of temperature from 108° to 110° and over, by the failure of the blood to receive the cooling influence of the air, should be deemed sufficient cause to account for the rapid loss of weight noted in an inappreciable lapse of time, by reason of the insensible transudation of fluids, which must take place. He says: "How an insensible transudation of fluid is to account for the rapid loss of weight (three-fourths ounce) noted by me, the doctor does not say." As before stated it is most regrettable that the author does not give the temperature (internal and external) of his dying patients, but depends entirely on prethermometric methods of procedure. He believes it is erroneous to suppose that the failure of the blood to receive the cooling effects of the air in respiration causes the rapid rise in temperature at death, as noted by me, and that the effect of a high temperature of the body at death on the loss of weight is so slight that it may be disregarded. It is also regrettable that the author does not give in exact figures the weight of his patients, since he seems to have weighed them after a method he had devised. If he had reported the exact weight of each patient at various times, we should have known what was the full amount of percentage of loss of weight as each or any one of his patients ceased to breathe. Another fatal defect in his report

is, that he fails to tell what was the temperature of the room or rooms in which death occurred, whether the apartments were favorable to a rapid escape and diffusion of moisture. He says nothing about the humidity of the surroundings or of the barometric pressure of the atmosphere. He makes no remark as to the time of the year, whether his weighing was done in January or in August, or in any other month. Anatomists tell us that in a completely developed human body about two-thirds of the weight is water. The weight of my patient, who was aged 18, was, at death, about 130 pounds. It does not seem unreasonable to conclude, in the absence of the operation of other known physical causes, that the loss of weight of three-fourths ounce of water would be excessive from a body composed of two-thirds water (1,386 $\frac{3}{4}$  ounces of water) when suddenly raised from a temperature of 108° to 110° during a short space of time. Such rise of temperature actually occurred in the last agony of death of one of my patients. And, such a rise of temperature would seem to be similar to what must have substantially taken place in one of Dr. Macdougall's cases, as he now recounts the symptoms. Now if the author refuses to admit that the air at the temperature, say of 65° to 70°, when taken into the respiratory passages of a patient of about such a weight whose body temperature is as high as 108°, has no material effect in cooling the blood, in retarding a further rise of temperature, thereby lessening for the time being the escape of moisture, I shall have to leave him to battle with competent physiologists and writers on legal medicine. Here, it may be incidentally remarked, that the beneficial effects of outdoor treatment of patients suffering from tuberculosis, and having at times more or less elevation of temperature, are largely due to the cooling influences of such air, when it is comparatively free from moisture, dust, and other deleterious elements. This fact is so obvious as to need no argument. When, on the other hand, there is a tendency of the bodily temperature to become subnormal, such cooling treatment often becomes positively injurious.

Dr. Macdougall says in his first paper that his experiments were carried out on 15 dogs but the results were uniformly negative—no loss of weight at death. According to Mr. Stonehenge, a high English authority, the short hairs of a smooth-coated dog may sometimes be seen glistening with fine beads of liquid, poured out on a hot day, when strong

exercise has been taken. The tongue, however, is the grand means of carrying off heat by evaporation, and its extensive surface, when hanging out of the mouth, is sufficient for the purpose, as the fluid is carried off more rapidly from the air passing over it in expiration. It is obvious that at the moment of death, heat by the evaporation of fluid from the extensive surface of the tongue would suddenly cease to be carried off and, the evaporation of fluids from the skin would be very deficient, owing to the hair when existing in any considerable quantity being a poor conductor of heat and moisture. This peculiar condition which exists in the dog would seem to be a sufficient reason why Dr. Macdougall's results were negative and not because his canines, as he would have us believe, had thereby been proved to have no ponderable soul substance. Dr. Macdougall believes I am wrong in stating that the internal organs are poor conductors of heat, yet the tissues near the general surface of the body are prone to radiation of heat and the diffusion of moisture, particularly after respiration ceases. I still maintain this position. One reason why the general surface is so prone to such changes arises from the fact that the tissues immediately at death become relaxed. All the vital processes have come to an end: The pupils of the eyes suddenly dilate, the sphincters that close certain natural openings fail to constrict, and all the perspiratory convoluted tubes situated beneath the true skin and the spiral ducts which open obliquely under the scales of the epidermis are more or less open on account of the sudden absence of contractility of their muscular elements. Such a condition favors a sudden, corresponding transudation and escape of the watery contents of these vessels. The evaporation of fluids so taking place tends to lessen the heat of the general body surface, whereas the deeper organs are slower in parting with heat since they are composed of fully two-thirds water not in immediate contact with the atmospheric air. This fact of the longer retention of heat by the deeper organs after death has been made evident to me in nearly 400 autopsies, some conducted by myself, and some by other physicians. The presence of heat noted in some of the deeper organs, at autopsy some 24 hours after death, was not due materially to chemical changes, as shown by the fact that pieces or specimens taken for microscopic purposes often exhibited to advantage the normal as well as the morbid processes that had long been going on.

## HYPOTHESIS CONCERNING SOUL SUBSTANCE.

BY

DUNCAN MACDOUGALL, M. D.,

of Haverhill, Mass.

*To the Editor of American Medicine:*—In taking advantage of the opportunity afforded me to reply to Dr. A. P. Clarke's second article, I wish to point out that the doctor practically resorts to an additional series of objections against my experiment and fails to meet the criticism of his high temperature theory of the weight loss noted in my experiment which you so kindly published in the July number of *American Medicine*. His reply purports to be an answer to my criticism of his theory, in reality it is a new series of objections against my experiment and hypothesis.

I had not intended to enter into any further discussion of the subject, for the reason that such discussion is fruitless and barren, a mere championing of opinions, when it were far better to appeal to nature herself and get facts for arguments.

Since temperature records have not been taken in conjunction with the weighing of human beings at death, there is here an opportunity for Dr. Clarke, or others who are of the opinion that temperature is a factor of any importance in affecting the results in my experiments, to make such modifications of the experiment as are deemed necessary, and discover for themselves the answer that nature would give.

In his reply, Dr. Clarke still persists in attaching great importance to the cooling influence of the respired air as a factor in determining body temperature, and regrets that I have not recorded the month of the year in which the experiments were made, nor the temperature of the room, nor the barometric findings. He also regrets that the weight of each patient at various times in the experiment was not given, so that he might have the varying percentage of loss of weight. Also that I have not given the weights of my patients.

I will take the last objection first. I have in my possession the weights of my subjects, but as the question to be determined by the experiment was not the weights of the subjects, *but the rate of loss of weight while dying, and whether any unusual loss of weight occurred at or after death*, I did not deem it necessary to burden my original article with that matter.

Whether the dying subject weighed 70 or 80 or 90 or 100 pounds (and these were about the

average weights) to begin with, had no bearing whatever on the question to be determined so long as we knew the weight of the patient when the experiment began, and recorded the progressive loss as the experiment proceeded.

*The thing to be proved was the rate of loss preceding death due to known causes, and to see if at or after death any loss of weight occurred that could not be accounted for by these known causes.*

This rate of loss was determined by having the patient on the bed of the apparatus *continuously* for a sufficient length of time before and during death and after. That I have not given the particular weights at which each patient began the experiment surely does not vitiate my records concerning the *rate of loss before death*, and the *unusual loss at death*, both of which are the *really vital matters at issue*.

Concerning the absence of records of the varying percentage of loss of weight throughout the experiments, that would be simply adding a problem in proportion not affecting the question at issue.

Concerning the barometric and thermometric conditions of the atmosphere surrounding the tests, when I say that these were practically uniform for each test by itself, and throughout the whole duration of each test, it will be seen at once that it is not essential to know what they were, inasmuch as the rate of loss before and the unusual loss at or after death occurred practically under the same barometric and thermometric conditions.

Of much more importance are certain aspects of the experiments to which the doctor makes no reference. For instance: How sensitive was the balance, how much or how little of a variation would it show? Up to what figure would the balance weigh, and yet show its smallest variation? In how many of my experiments did I exceed or encroach upon the maximum figure at which the balance would show its smallest variation? The balance used was the Fairbank's standard scale of the kind used for weighing silk, with a maximum capacity of 300 pounds and showing a variation of a quarter of an ounce. The particular scale used was sensitive to one-fifth of an ounce with about 200 pounds as the combined weight of frame, bed, patient, and clothing. The combined weight never exceeded 206 pounds, so I was well within the limits of my scale.

To the doctor's theory of the cessation of weight loss in the canine at death I give ready assent, but I would not limit the surface parting

with moisture to the tongue, I would consider the entire buccal mucosa and the mucosa of the respiratory tract as surface parting with moisture to the tidal air, and as the tidal air diminishes the loss diminishes, and when it ceases the loss ceases. Here the doctor is on solid ground, the theory corresponds with the facts in the case, but all that has no explanation in it of the unusual and unaccountable loss in the human subject, for which his high temperature theory was put forth.

The doctor ignores the explanation of high antemortem and postmortem temperatures which I gave in my reply; an explanation much more in accordance with the known facts of physiology, than the one to which he clings, namely, that the loss of the cooling influence on the blood of the respired air is the main factor in this rise of temperature.

As my explanation, and the implications that spring from it, are so necessary to a correct understanding of my position, I here repeat it. *The explanation is that at death there is a co-existing respiratory and cardiac failure, a failure of the peripheral circulation, a blanching of the skin and upper respiratory passages due to diminished blood supply, and a consequent checking of the radiation of heat from the surfaces that in life radiate the body heat.*

The implications that follow if this explanation is the correct one (and I believe it to be) are, *first that the checked radiation of heat is the cause of increased body temperature occurring antemortem and postmortem, the second implication is that with a diminished radiation of heat, it necessarily follows that there is a diminished and not an increased evaporation of moisture from the body, and so Dr. Clarke's theory of the weight loss fails at the crucial point.*

Regarding the doctor's reference to the metaphysics in the case I have this to say, that while progress has sometimes been made by accidental discovery and pure empiricism, it has more often come from the projection of the mind into the possibilities of the endless and intricate relations subsisting among things, and from a given new conception of such relations, many a new relation has been discovered and become accepted truth.

Concerning the particular question of continued life after bodily death, to my mind, if this is true, there must be a space-occupying mechanism or organism of some kind (unless indeed the idealists are right), perhaps demonstrable by investigating the phenomena of death, perhaps not demonstrable, but it is a conception that at least gives the sanction of common sense and reason to experimentation.

## A FEW POINTS IN THE ANCIENT HISTORY OF MEDICINE AND SURGERY.

BY

HARRY H. GRIGG, M.D.,  
of Berkeley, Cal.

*To the Editor of American Medicine:*—Circumcision was first performed on Abraham in 1897 B. C. by means of a sharp stone.

Sharp stones were the primitive surgical instruments.

Hippocrates was born in 460 B. C. and is the first great scientific physician on record. He is the father of medicine and surgery.

In the time of Hippocrates the actual cautery was used in the treatment of hemorrhoids, the trephine was also in vogue.

Archagathus was the first to practise surgery in Rome. He was driven out because of the too liberal use of the knife and the searing iron.

Celsus was the first to describe the operation for cataract. His writings appeared during the first century A. D.

Soranus in 98 A. D. dissected the human body. He improved obstetrics and gynecology.

The rectal speculum was used in Hippocrates time but the vaginal speculum appears first in medical history in the writings of Archigenes in the first century A. D. The use of this instrument fell into disuse for 1,000 years before it was taken up again. The probable reason for this is the domination of medicine by the Arabian school—the Mohammedans forbid the examination of women by any other than their own sex.

Paulus of Egina was the greatest obstetrician of the sixth century and midwives demanded his services in consultation for miles around.

Mandragora was the first anesthetic known to the ancients. Hemp and opium were widely used to produce insensibility.

Amputation dates from Hippocrates who, in his treatise on joints, describes amputation for gangrene but recommends that no living tissue should be destroyed.

Gonorrhea, evidence of this disease exists in the writings of Moses, Herodotus, Celsus, and Hippocrates.

Syphilis, the earliest possible knowledge is 1495 A. D., at which time an epidemic occurred in the French army who were fighting against the kingdom of Naples. The whole of Europe suffered from this epidemic.

Lithotomy was performed long before the Christian era by the Hindoos, but Celsus was first to describe it.

Cesarean section was first described by Ambrose Pare in 1509, though there is evidence of its early performance by the Hebrews.

ORIGINAL ARTICLES.

READY TABLES FOR MODIFIED MILK.

BY  
JOSEPH O'MALLEY, A. C., M. D.,  
and  
AUSTIN O'MALLEY, M. D., PH. D.,  
of Philadelphia.

When a physician who has not made a special study of pediatrics is suddenly called

upon to put an infant "on the bottle," he is always at a loss to know the exact ingredients of the first feedings. The text-books confuse him by too copious information.

The following table will serve to begin with; and thereafter changes may be made as symptoms show the need of more or less of some or all the ingredients.

The mixtures in Tables I and II are intended for a baby of the average condition at the age

TABLE I.  
MIXTURES FOR 24 HOURS' FEEDING.

Age.	Hours between feedings.	Feedings in 24 hours.	Ounces of food in each bottle.	Ounces of cream for whole 24 hours.	Ounces of milk for whole 24 hours.	Ounces of hot water for whole 24 hours.	Level teaspoonfuls of milk sugar for 24 hours. <sup>1</sup>	Teaspoonfuls of lime water in each bottle.
1 week . . . . .	2	10	1	3	4½	4½	2	½
2 weeks . . . . .	2	10	1½	2	2½	11	4	½
3 weeks . . . . .	2	10	2	3½	2½	14½	7	¾
4-6 weeks . . . . .	2-2½	10-8	2½-3	4½	1½	16½	7	1
6 weeks . . . . .	2½	8	3	4	5½	14½	7	1
7 weeks . . . . .	2½	8	3½	4½	6½	15½	7	1
2-3 months . . . . .	2½	8-7	3½-4	6½	8½	13	7½	1
4 months . . . . .	2½	7	4½	5	11½	15	7½	1½
5 months . . . . .	3	6	5½	5½	11½	16	7½	2
6 months . . . . .	3	6	5½	5½	12½	16½	7½	2
7 months . . . . .	3	6	6½	6	13½	18	7½	2
8 months . . . . .	3	6	7	5	22	15	7	none
9 months . . . . .	3	6	7	3½	28¾	9¾	7	none
10 months . . . . .	3	5	8½	2½	32½	7½	7	none
11 months . . . . .	3	5	8¾	whole milk pasteurized; no sugar, no l. water.				
12 months . . . . .	3	5	whole milk pasteurized.					

TABLE II.

To make up one bottle, if a single bottle is spilled or broken, or if an additional bottle is needed for night feeding; this single bottle must be pasteurized like the others.

Age.	Cream.	Milk.	Water.	Level Teaspoonfuls of Milk Sugar. <sup>2</sup>
1 week	2½ dr.	3½ dr.	3½ dr.	½
2 weeks	1½ dr.	1½ dr.	1 oz.	½
3 weeks	2½ dr.	1½ dr.	1½ oz.	¾
4-6 weeks	3½ dr.	1½ dr.	2 oz.	¾
6 weeks	½ oz.	5½ dr.	1¾ oz.	¾
7 weeks	½ oz.	6½ dr.	2 oz.	¾
2-3 months	6½ dr.	1 oz.	1 oz. 5 dr.	1
4 months	5 dr.	1½ oz.	2 oz. 1 dr.	1
5 months	7½ dr.	1 oz. 7½ dr.	2½ oz.	1¼
6 months	7½ dr.	2 oz.	2½ oz.	1¼
7 months	1 oz.	2 oz. 2 dr.	3 oz.	1¼
8 months	6½ dr.	3½ oz.	2½ oz.	1
9 months	4½ dr.	4 oz. 6 dr.	1½ oz.	1
10 months	4 dr.	6½ oz.	1½ oz.	1
11 months	8¾ oz. whole milk.			

<sup>1</sup> If cane sugar must be used put in half the quantity indicated in this column. At the seventh month it is decidedly advantageous to add 2 tablespoonfuls of a "malted food," to the 24 hours' mixture.

<sup>2</sup> If cane sugar must be used put in half the quantity indicated in this column.

indicated. The quantities have been estimated upon a 16 percent cream standard, but any good whole (unskimmed) milk and pure cream may be used.

The paneled measures, "maternas," for modifying milk change too abruptly from panel to panel, and some of them use too much sugar.

In making the mixtures use a four-ounce graduated glass, or get a graduated nursing bottle that has been tested as a measure by a druggist. The graduation on the ordinary nursing bottle is commonly incorrect. The wide, cup-like bottle, which has a rubber "breast" on it, is more accurate.

In the morning, the earlier the better, make up the mixture for the 24 hours, pasteurize it all, and place the bottle in a refrigerator, or better in a baby's refrigerator, which costs two or three dollars at the hardware shops.

In making a mixture the mother should be reminded that there are 8 drams in an ounce; that  $\frac{1}{2}$  oz. is 4 drams;  $\frac{3}{4}$  oz. is 6 drams. Always use boiled water in a baby's food, and let it be hot when the mixture is made. Dissolve the milk sugar in the water first, then add the cream and milk, and put the food into each bottle through a funnel.

Nursing bottles must have rounded bottoms; they should never have glass or rubber tubes attached to them. They are to be washed every morning with soapsuds within and without (never with lead shot) and thoroughly rinsed; then put under clean water in a pan and boiled for a half-hour. The nipples must be boiled for 15 minutes (boiled, not merely left in the water for 15 minutes), then kept in a covered vessel till needed. The nurse should never handle the part of a nipple that goes into the baby's mouth; above all, she must never taste the milk through a nipple. Be certain the nipple fits the baby's mouth, and do not push it too far back into the mouth. When it grows soft throw it away. The nipple frequently is blocked by a wisp of cotton from the bottle-stopper. This should not be removed by the fingers. Change the nipple, clean it at leisure, and boil it again.

The baby's milk should never be given cold, nor too hot. Heat it to 98° F. in a pan of water just before the feeding. After a few trials the mother can tell the proper temperature by touch.

Put the lime water into each bottle immediately before feeding, not before pasteurizing.

*Pasteurization.*—After the proper quantity of food has been poured into each bottle, see that the inside of the bottle-neck is dry, then put in stoppers of absorbent cotton. Place the bottles upright in a pan filled with cold water up to the level of the milk. Heat only to *beginning* simmering of the water. Do not wait longer or you will boil the milk, and a baby cannot digest boiled milk. Some one must stay near the pan and watch it. When the water begins to simmer, remove the pan from the stove; wrap the pan, containing the bottles and the water, in a blanket, and let the package stand for a half-hour. The food is then pasteurized. Set the bottles as soon as they are cool (not an hour or two later) in the refrigerator. Never get the corks wet, and never use a cotton cork twice.

*Effects of Erroneous Feeding.*—If a baby has colic, curds in the stool, or a discolored stool, the causes are either (1) that the milk has been boiled instead of pasteurized; or (2) that the proper intervals between feedings have not been observed; or (3) that there is too much milk in the mixture for the baby; or (4) that there is too much cream in the mixture; or (5) that there is too much sugar.

1. By pasteurizing the first cause is removed. If the milk has been boiled in a careless attempt to pasteurize, it should be all thrown out and the mixture made over again.

2. No matter how much a baby cries it should be fed only at the stated time. First, however, find out whether the baby is getting enough food, especially when the time for a change in the formula is about to take place. Some babies require food beyond that prescribed for a certain age.

3. If there is too much milk in the mixture there will be undigested curds in the stool. If, however, the baby is getting too much

cream there may be masses of undigested fat in the stool, which resemble curds; and it may be difficult to distinguish these masses from curds. In doubt, get a little ether and pour it on the lumps; if they are curds they will not be changed, if they are fat they will dissolve. If they are curds, then take out  $\frac{1}{2}$  oz. milk from the whole 24 hours' mixture, and substitute  $\frac{1}{2}$  oz. water. If they are fat-lumps take out  $\frac{1}{2}$  oz. cream from the whole 24 hours' mixture, and substitute  $\frac{1}{2}$  oz. water. If the masses still persist, lower the milk or cream a little more. If the baby regurgitates, it is probably getting too much cream. Then take out  $\frac{1}{2}$  oz. cream and substitute  $\frac{1}{2}$  oz. water in the 24 hours' mixture.

If the baby has greenish, irritating stools, colic, sour-smelling vomit, belches, it is probably getting too much sugar. Always use a milk sugar made by a reliable firm; if this is too costly, use half as much cane sugar. Most food formulas contain too much sugar. Mothers should be warned that greenish stools are dangerous, and that the physician should be called before any experimentation with sugar is made.

Constipation in a baby is caused by lack of either milk, cream or sugar. Usually the cause is the lack of sufficient cream. First try adding  $\frac{1}{2}$  oz. cream to the 24 hours' mixture and taking out  $\frac{1}{2}$  oz. water. Chronic constipation in a baby commonly means a defect in the feeding. There should be no need of enemas and phosphate of sodium, if the food is correct. To prevent constipation do not rely upon an increase in the cream alone, because such an increase while temporarily relieving the constipation may derange digestion. Raise also the quantity of milk gradually.

#### APPROXIMATE AVERAGE WEIGHT OF A BABY DURING THE FIRST TWO YEARS.

WEEKS.	POUNDS.	OUNCES.
Birth, .....	7	8
1 week, .....	7	4
2 weeks, .....	7	10
3 weeks, .....	8	
4 weeks, .....	8	8 1 month.
5 weeks, .....	9	
6 weeks, .....	9	6
7 weeks, .....	9	12

WEEKS.	POUNDS.	OUNCES.
8 weeks, .....	10	4 2 months.
9 weeks, .....	10	12
10 weeks, .....	11	2
11 weeks, .....	11	8
12 weeks, .....	11	14
13 weeks, .....	12	4 3 months
14 weeks, .....	12	12
15 weeks, .....	13	1
16 weeks, .....	13	8
17 weeks, .....	13	12 4 months.
18 weeks, .....	14	
19 weeks, .....	14	4
20 weeks, .....	14	10
21 weeks, .....	15	5 months.
22 weeks, .....	15	4
23 weeks, .....	15	8
24 weeks, .....	15	12
25 weeks, .....	16	
26 weeks, .....	16	4 6 months.
27 weeks, .....	16	8
28 weeks, .....	16	11
29 weeks, .....	16	15
30 weeks, .....	17	2 7 months.
31 weeks, .....	17	6
32 weeks, .....	17	10
33 weeks, .....	17	13
34 weeks, .....	18	8 months.
35 weeks, .....	18	4
36 weeks, .....	18	8
37 weeks, .....	18	10
38 weeks, .....	18	11
39 weeks, .....	18	13 9 months.
40 weeks, .....	18	15
41 weeks, .....	19	3
42 weeks, .....	19	6
43 weeks, .....	19	10 10 months.
44 weeks, .....	19	12
45 weeks, .....	20	
46 weeks, .....	20	3
47 weeks, .....	20	6 11 months.
48 weeks, .....	20	9
49 weeks, .....	20	12
50 weeks, .....	21	
51 weeks, .....	20	4
52 weeks, .....	20	8 12 months.
MONTHS.		
13 months, .....	22	
14 months, .....	22	6
15 months, .....	22	14
16 months, .....	23	8
17 months, .....	24	2
18 months, .....	24	10
19 months, .....	25	2
20 months, .....	25	7
21 months, .....	25	12
22 months, .....	26	
23 months, .....	26	8
24 months, .....	27	

#### HUMAN MILK.

1. *Reaction*.—Normally, alkaline; never acid.
2. *Specific Gravity*.—1.029–1.032, average 1.031.

In examination, take the specific gravity first. It often happens that a patient does not send enough milk to get the specific gravity with the ordinary lactometer. Then use the specific gravity beads. Put a given quantity of milk, say two fluid drams (120 minims), in a tube and drop in the "35" bead, if this sinks try the "30" bead, and so on. If the 35 bead sinks and the 30 floats, the specific gravity is between 1.035 and 1.030. Add water, counting the minims, till the 30 bead just sinks; then multiply the figure on the bead, which is just made to sink, by the total quantity of fluid (milk and water), and divide the product by the quantity of milk. The quotient will be the last figures of the specific gravity (third and second decimals). Suppose it requires 10 minims of water to sink the 30 bead, then,

$$120 : 120 + 10 :: 30 : x;$$

$$x = 325;$$

*i.e.*, the specific gravity is 1.0325.

This method is not very exact but it serves for ordinary information.

3. *Fat*.—Normally, 3-5 percent; average, 4 percent. To find whether there is fat enough in a given milk Dr. Holt's "Milk Set for the Clinical Examination of Human Milk" is a good apparatus.

There is in this set a tube which holds 10 cc. milk and it is graduated into 100 parts, one part equals one percent. Fill this tube to the 100 cc. mark with milk, let it stand for 12 hours, and then the percentage of cream may be read off directly from the bottom of the top meniscus.

It happens that the ratio of fat to cream in milk is 3 : 5; therefore the percentage of fat is found by the formula,

$$3 : 5 :: x : \text{the cream-reading.}$$

Suppose that in the case under examination the cream is 4 percent; then,

$$3 : 5 :: x : 4;$$

$$5x = 12;$$

$$x = 2.4 \text{ percent fat.}$$

Such a milk would be low in fat.

4. *Proteids*.—The exact methods for determining proteids in milk are too complicated for clinical purposes and are not necessary.

*Proteid in Milk*.—This test is easily made and it is quite satisfactory; it was introduced by Dr. Boggs of Johns Hopkins Hospital.

Reagent:—Phosphotungstic acid, 25 grams; strong hydrochloric acid, 25 grams; distilled water, 200 cc.

Dilute human milk 1:10 (2 cc. milk to 20 cc. water is the most convenient quantity), and with this mixture fill an Eschbach albuminometer up to the U mark; then add the reagent up to the R mark, mix by inverting the tube several times, and let the mixture stand for about 24 hours.

The degree marks on an Eschbach albuminometer indicate so many grams of albumin in a liter of fluid; hence one degree equals one-tenth of one percent. If the dilution is 1:10 you may read the percentage directly (*i.e.*, each degree is one percent); if the dilution is 1:20 (the best dilution for cow's milk) you double the reading to get the percentage.

Normal cow's milk should contain about 4 percent proteid, and normal human milk should contain about 1.50 percent proteid.

The following rules give a notion of the proteid content of a milk without actual analysis:—(a) if the fat is high (8-10 percent), and the sp. gr. high (1.033-1.034), the proteids are high; (b) if the fat is low, 3-4 percent, and the sp. gr. high, the proteids are normal; (c) if the fat is high, and the sp. gr. low, the proteids are normal; (d) if the fat is low, and the sp. gr. is low, the proteids are low.

To increase the total quantity of the milk, increase the liquids, give the woman porter, if there is no danger of inducing alcoholism in her.

To increase fat, increase the meat diet.

To decrease the fat, decrease the meat diet.

To increase the proteid, decrease exercise or work.

To decrease proteid, increase exercise or work.

Worry and other emotional causes, and a lack of healthy exercise, lower the solids in milk.

If a baby is losing weight on the mother's milk and her milk cannot be improved, the

sooner the baby is put on artificial food the better.

#### Cow's MILK.

Cow's milk when very fresh is slightly alkaline; after standing a little while it becomes slightly acid. Its specific gravity is 1.027-1.033; average, 1.030. Below 1.027, with no fat to make it low, denotes probable watering; if the sp. gr. is above 1.033 it has been skimmed.

*Formalin in Milk.*—Put in a test-tube one volume milk and one volume water; pour down the wall of the tube four volumes of strong sulfuric acid in which are a few drops of ferric chlorid. If formalin is present there will be a violent coloration between the acid and the milk.

*Bacteria in Milk.*—5000 bacteria to 1 cc. milk should be the toleration-limit in a baby's food. To count the bacteria: (1) Put 1 cc. of the milk in 50 cc. water (mixture a); (2) put 1 cc. of mixture a in 50 cc. water (mixture b); (3) put 1 cc. of mixture b in 10 cc. liquefied agar.

Mixture c is a 1:5000 milk mixture. Pour this into a Petri dish, and leave it in a thermostat. Each colony found after incubation represents one original bacterium. Therefore after 12 hours count the colonies, and multiply the sum by 5000 to get the number of bacteria in the original 1 cc. of milk.

*Diet from the Twelfth to the Eighteenth Month.*—The feeding must be done at regular intervals.

Breakfast. A soft-boiled or poached egg with bread broken in it; or one of the wheaten breakfast foods. Oatmeal disturbs digestion.

10 a. m. A bottle or cup of milk.

Dinner, about 1.30 p. m. Bread and lean gravy, or beef juice, or an egg, with a cup of milk. Rice, tapioca, or sage pudding, or junket.

5 p. m. Milk.

Bedtime. Milk.

*Diet from Eighteen Months to Two Years.*—Breakfast. As above, with the addition of bread and butter or some unsweetened biscuit.

10 a. m. Milk and bread or cracker.

Dinner. Rice with gravy, or baked or mashed potato with gravy. Finely cut meat or fish, bread and butter. Broth may be used, but it must be thickened with some cereal. It is unwise to trust to broth in preference to other foods.

Supper. Bread and milk.

Eczema is suggestive of too much proteid in the food. Indigestion is caused by irregular feeding, by too much starchy food, by fruit, candy, cakes.

In hot weather make the food as simple as possible; go back to the diet suggested for about the fourteenth month.

Up to at least the fourth year avoid hot bread, muffins, fried food, highly seasoned food, coarse or raw vegetables, apples and bananas, tea, coffee, candy, cakes, pastry, preserved fruit.

### CLINICAL OBSERVATIONS ON UNCINARIASIS.<sup>1</sup>

BY

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The object of this paper is to give an account of recent work done on uncinariasis in Bilibid Prison of this city, to which institution I was detailed as physician a little over a year ago. To give some idea of the scope of the hospital work there and the opportunities for clinical observation, I need only mention that the prison has a daily population of about 3,800 prisoners and maintains a hospital of 150 beds for general cases and a separate hospital of 150 beds for tuberculosis cases, the latter being situated in another part of the city and having its own physician. A quarantine pavilion, in which all recent admissions to prison are kept for a period sufficient to develop any latent infection, is also a part of the hospital system. The patients presenting themselves for observation and treatment are from all parts of the Archipelago, from Northern Luzon to Southern Jolo, and from all stations of life, although the lower classes or taos predominate. The

<sup>1</sup>Read at the Fourth Annual Meeting of the Philippine Islands Medical Association, at Manila, P. I., on February 28, 1907.

care and responsibility of such a number and variety of cases, the outpatients and surgical work, leave little time for individual treatment and render satisfactory observation of all cases a mental and physical impossibility, particularly when the day is limited to 24 hours. This results to a certain extent in mechanical and routine treatment and I may add mechanical and routine observation. A certain symptom or set of symptoms not strikingly apparent, might pass unnoticed in one case. However, the same symptoms presented in 2, 10, 20 or 100 cases are sure to raise the query "why?" and "why?" is a hard question.

From the beginning of my work in Bilibid, I was puzzled to account satisfactorily for the anemic condition and certain symptoms presented by many of the patients coming on sick report, more particularly those new admissions from outside, prisoners recently brought from provinces in different sections of the Islands. This refers to cases not presenting definite symptoms of the diseases recognized as prevailing, as tuberculosis, dysentery, beriberi, etc. It is believed that the facts presented below will throw some light on the question to the extent at least of accounting for a goodly percentage of the sickness.

Uncinariasis is an endemic anemia caused by the parasite (either *Uncinaria duodenalis* or *Uncinaria americana*). So much has already been written by high authorities on this disease that it is deemed unnecessary here to enter into full details regarding its history or etiology. The two principal varieties of the parasite have been fully described by various writers. The work of the Porto Rican Commission, the report of Stiles and the writings of Looss may be read with profit by those interested in the details.

For some time past routine examinations of the blood, urine and feces have been made in all cases. Ova of *Uncinaria*, *Tricocephalus dispar* and *Ascaris* were frequently reported. The large number of uncinaria ova found suggested to me a possible explanation of the numerous cases presenting only obscure symptoms, and on October 29, 1906, systematic labora-

tory examinations of the feces in all quarantine cases were begun, in addition to the routine work. Approximately 1,000 examinations of quarantine cases have been made since that date.<sup>1</sup> Of 849 of these, 530 were admitted to hospital for treatment; these included 243 cases of uncinariasis, 63 cases of amebic dysentery, 3 cases of *Balantidium coli* infection, 186 of *Ascaris* infection, 7 cases had *Tænia* and the rest of the admissions had acute dysentery with *Strongyloides*, *Tricocephalus dispar* and *Monads* present. This would indicate that the intestinal parasites are being constantly brought into the prison and among them the uncinaria in the proportion of 24 percent of all admissions.

All admissions to hospital are now regularly examined for intestinal parasites and appropriate treatment instituted in infected cases. I have taken notes of 492 cases of uncinariasis admitted to the hospital from all sources, and while the records in these cases are not complete, owing to lack of time and laboratory facilities, it is believed that some points of interest may be brought out.

A list of the provinces in which these cases originated is given below. The geographic distribution so far worked out is as follows: In the island of Luzon, the provinces of Albay, Batangas, Bataan, Bulacan, Cagayan, Camarines, Cavite, Ilocos, Isabela, Laguna, Manila, Nueva Ecija, Pampanga, Pangasinan, Rizal, Sorsogon, Tarlac, Tayabas, Union, Zambales. This includes practically all of Luzon except the mountain districts; in Panay, the provinces of Antique, Capiz, and Iloilo; in Mindanao, the provinces of Misamis and Surigao and the Lanao district. Other islands affected are Cebu, Leyte, Samar, Negros, Bohol, Romblon, Camiguin and Catanduanes. From Leyte there were 92 cases. Of the 492 cases recorded 10 were native women, 14 were Americans or Europeans, while the remainder were native men.

<sup>1</sup> About two-thirds of the microscopic examinations were made by Doctors W. E. Musgrave, Ralph T. Edwards and Philip T. Garrison, and Moses T. Clegg of the Bureau of Science, Manila. The remaining one-third were made by myself.

Some of the symptoms noticed in the majority of these cases were headache, vertigo, insomnia, dyspnea, palpitation, colic, constipation or diarrhea, brown or yellow mucus or bloody stools, albuminuria and edema. In many cases there was moderate fever. A number of cases were complicated by amebic dysentery or beriberi. Most of them had also *Ascaris* and *Tricocephalus dispar*. Some cases showed no clinical symptoms, the microscopic test alone revealing the condition. The most severe cases were those complicated with chronic intestinal catarrh.

The diagnosis may be quickly and easily made provided a microscope is at hand. A minute portion of feces is placed on the slide, a coverglass is applied and the specimen examined, using a two-thirds or one-sixth inch objective with a number three or four eye-piece. A number of textbooks give very good illustrations of the uncinaria ova as seen microscopically. The egg contents are gray, granular, and may present various stages of subdivision; the shell is smooth and translucent. These characteristics distinguish it sufficiently from most other ova. A little practice will enable the physician to make his own examinations. Lacking a microscope, some old textbooks are said to have advised waiting for the spontaneous expulsion of some of the parasites. Commenting on this, one Spanish author says that we would probably have to wait years and years. However, we need not despair on this account for there is another way. Given the symptoms which lead us to suspect the disease, we are perfectly justified in giving appropriate treatment, after which the stools may be carefully examined for uncinaria. In this way we may even gain time. The examination of the stools macroscopically is not easy, however. You will need good eyes, or, perhaps a handglass, and a hook or forceps to pick out the parasites. An equal volume of water should be added to the stool, all should be shaken and after a minute the top poured off, more water added and the process repeated three or four times. Uncinaria tend to sink and will be found mostly in the sediment at the

bottom. I have some specimens which show the parasites. Each bottle contains uncinaria from a single case.

With timely treatment the prognosis in uncomplicated cases is good. Death due directly to the disease is probably rare here. Within my observation there is no record of one. The anemia probably predisposes its victims to other severe or fatal diseases.

At first thymol was used in the treatment. Later, I read in the London *Lancet*, of February 3, 1906, an article by Phillips in which he gave his results with oil of eucalyptus. I copied his formula and have used it successfully since. It reads as follows: 2.5 grams of oil of eucalyptus, 3.5 grams of chloroform and 40 cc. of castor oil, divided into two doses and given on an empty stomach one-half hour apart. In my treatment I have increased the dosage, giving 30 cc. of the same formula and repeating it in half an hour. At six a. m. the patient is given a dose of magnesium sulfate, at 8 a. m. the first 30 cc. of the eucalyptus mixture, at 8:30 a. m. the second 30 cc. is given, and at 10:30 a. m. another dose of magnesium sulfate. Fasting is necessary during the treatment but in the evening the patient may partake of light food. In giving thymol it is my custom to give magnesium sulfate at 6 a. m., followed at 8 a. m. by one gram of thymol and the same every half hour thereafter until six doses are given. Two hours after the last dose of thymol another dose of magnesium sulfate is given. Of the 492 cases previously mentioned, in 345 the eucalyptus treatment was given as follows:

Two hundred and seventy patients received one treatment; 58 patients received two treatments; 16 patients received three treatments; one patient received four treatments before the feces were reported negative. Ninety cases were given thymol as follows: Sixty-one patients received one treatment; 13 patients received two treatments; 9 patients received three treatments; 4 patients received four treatments; 3 patients received five treatments.

Twenty-seven patients were given a treatment of thymol and another later of euca-

lyptus. One patient was given oil of aspidium, having tenia as well as uncinaria. Twenty-nine cases are without data. Both the thymol and eucalyptus produce good results but I am inclined to prefer the latter. Beta-naphthol, we have not used.

The prevention of uncinariasis must lie in personal cleanliness and in the treatment of infected individuals, disinfection of the feces or the prevention of their deposit in moist situations and near dwellings. The free use of salt water has been suggested by Manouvriez in Vol. 53, No. 22 of *Bulletin de l'Academie de Médecine de Paris*. He states that a 2 per cent solution destroys the larvas. Stiles describes a method of using a spray of burning oil to disinfect the earth of premises infected with larvas. He also advises the wearing of shoes to prevent the ground itch, the "mazamorra" of Porto Rico.

The work on uncinariasis at present is hardly more than begun, it being my intention to continue the microscopic examinations and the treatment in hospital of all infected cases throughout the prison, with a view to eliminating the disease, thus improving the general health of the prison population and rendering it less susceptible to prevailing diseases, but the work is necessarily slow, due to lack of adequate hospital facilities. There has been a marked decrease in the deathrate during the past few months and it is believed that the systematic treatment of uncinariasis has contributed materially to this result.

In the interests of public health, the advisability of extended investigations of the disease throughout the Islands is suggested, with the adoption of such measures as local conditions shall be found to demand.

**A Natural Bone-setter.**—James W. Sweet, one of the famous Connecticut family of "bone-setters," died on August 18, at his home in New Haven. His grandfather, father and two uncles were all "natural bone-setters," and had a large clientele. James Sweet claimed to have "set" 35,000 bones during the 30 years of his career.

## SYPHILITIC ENLARGEMENT OF THE SALIVARY GLANDS.\*

BY

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Syphilitic enlargement of the salivary glands is such an uncommon condition that a brief review of the literature at my command and the report of an additional case seem justifiable. The affection may occur either during the secondary or tertiary stage of the disease. Osler<sup>1</sup> cites the case of a student who had parotitis occurring during the course of secondary syphilis.

J. Neuman<sup>2</sup> has observed five cases of secondary syphilitic parotitis and one case of gumma of the sublingual gland.

CASE I.—E. M. Aged 24. Admitted November 27, 1891, chancre of right labium. The eruption appeared at the proper time with simultaneous enlargement of both parotid glands which were about the size of a dollar, uneven, tender, moderately hard, not painful; speaking, chewing and swallowing were painful. Mercurial inunctions reduced the glands to normal size in one month, the induration disappeared in about four months.

CASE II.—C. E. Aged 26. Admitted March 21, 1892. Mucous patches on genitals and in the mouth and macules and papules on the body. The disease had lasted between six and eight months. Both parotid glands were enlarged, very tender to the touch, the mouth opened with difficulty. Sublimate injections were used. April 18, a suppurating preauricular lymph gland was incised and the parotid gland beneath was found enlarged, uneven and flat. The sublimate injections were continued and potassium iodid dressings applied. May 2, the patient was discharged.

CASE III.—A. S. Aged 27. Admitted September 23, 1893. The disease had lasted four months, the parotid gland was enlarged and tender. Mastication was difficult, the preauricular gland was enlarged and adherent. October 20, the suppurating lymph gland was incised.

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Forty-one mercurial inunctions were given to December 24 when the gland was normal.

CASE IV.—F. C. Aged 23. Admitted March 8, 1893. Had syphilis for 10 months; both parotid glands enlarged, particularly the left. The right is hard, the left soft and elastic. April 8, discharged. Cured by mercurial inunctions.

CASE V.—T. P. Aged 24. Admitted March 30, 1894. Had syphilis one year. There was general adenopathy and maculopapular eruption. Both parotid glands, especially the right, were enlarged. There was salivation, both preauricular glands suppurated. There had been no treatment. Under mercury all symptoms disappeared.

CASE VI.—M. B. Had syphilis four years ago. There had been no treatment. There is a gumma of the sublingual gland and salivation. The preauricular glands suppurated twice. All symptoms disappeared under mercurial treatment.

Lanceraux<sup>3</sup> reports the case of a male of 45, who had multiple gummatous ulcers on the body and mucous membranes of the throat and a hard nodule in the right sublingual gland and who died of an intercurrent erysipelas. At necropsy the right sublingual gland was found hard and uneven with multiple retractions on the surface. On section the gland tissue was yellow from fatty degeneration. The interacinous connective tissue was in the form of broad fibrous bundles very much hypertrophied.

Fournier<sup>4</sup> reports the case of a male aged 30 who 11 years after infection rapidly developed a painless, circumscribed, hard nodule in the right sublingual gland. He regarded it as syphilitic and under the administration of potassium iodid it rapidly disappeared.

Verneuil<sup>5</sup> reports a case of a tumor of the sublingual gland which he diagnosed as syphilitic and cured under antisiphilitic treatment.

Kaposi<sup>6</sup> has observed both the parotid and sublingual glands involved in gummatous infiltration in late syphilis.

Lang<sup>7</sup> in an article on mastitis and parotitis syphilitica reports three cases. The first, a woman, aged 44, had a gumma of the parotid gland with ulceration and fistula formation.

In the other two cases he observed gummatous infiltration of the parotid gland together with other manifestations of late syphilis.

Osler<sup>8</sup> after a brief review of the literature of chronic symmetric enlargement of the salivary and lacrimal glands, reports the case of a colored child, aged 11, who had for more than a year enlargement of the lacrimal, salivary, and buccal glands, enlargement of the spleen, syphilitic rhinitis with ulceration, and who recovered during the administration of potassium iodid and mercury, to die two years later of chronic pulmonary tuberculosis. The author, however, in commenting and in recent editions of his Practice (3-4-5 editions) classifies it as Mikulicz disease of unknown origin.

Packard<sup>9</sup> reports a case in a boy nine months old with a history of hereditary syphilis of paternal origin, a gummatous mass involved the parotid gland, and there was pus in the external auditory canal, which when removed showed a normal drum. Incision over the abscess in front of the auricle and specific treatment proved efficacious.

Symmers<sup>10</sup> reports five cases of chronic bilateral parotitis among the insane; three unquestionably had been syphilitic.

Through the kindness of Dr. Charles P. Grayson, I am able to report the following case:

James McI. single, aged 29, boilermaker, presented himself at the Nose and Throat Department of the University Hospital complaining of a large, painful swelling over the right side of the jaw, deafness in the right ear, and mouth-breathing.

FAMILY HISTORY.—His father was killed in an accident at 58 years of age. His mother is aged 58 and in good health; one brother and three sisters are living and in good health; two brothers and one sister died in early childhood from causes unknown to patient.

PREVIOUS HISTORY.—He had measles at 13 years of age, no complications; vaccinated in childhood and at 23 years of age, for which he shows good cicatrices. On August 29, 1903, he had sexual intercourse the first time for nearly one year. September 29 following he noticed a single sore on the glans penis. December 12, 1903, he consulted a physician on account of sore throat which was soon followed

by falling of the hair and a rash which covered the whole body, but more noticeably over the limbs and chest; the glands in the groins were enlarged. During this time he was feverish, with headache, bone pains and loss of appetite; his voice was husky and he had a cough. He was told he had syphilis and a mercurial course which continued six months was started, the symptoms all disappearing at the end of six weeks. Since he stopped taking mercury in August, 1904, he has taken no medicine of any kind until the present attack began.

**PRESENT ATTACK.**—About five weeks ago he consulted a physician for swelling and pain at the angle of the right jaw, the pain radiating to the right temporal region. Deafness in the right ear soon became marked with tinnitus. At the same time nasal obstruction began which finally became complete. The diagnosis of rheumatism was made, and about December 7, a piece of flesh, as the patient described it, was cut from the right nostril.

**EXAMINATION.**—December 14, 1905, the date of his first visit to the dispensary: There is a large swelling on the right side of the face limited above by the zygomatic process in front of and below the ear, at the angle of the jaw extending forward under the jaw. The skin is tense and stained from repeated applications of iodine. By touch the outlines of the enlarged parotid gland and submaxillary gland can be made out, which are tender. The orifices of the salivary ducts are normal and pressure on the glands produces no abnormal discharge. It is impossible to introduce a speculum into the right external auditory canal. The left canal and drum membrane are normal.

A loud ticking watch is not heard in the right ear, by air conduction. Tuning forks A200, C500 when placed on the vertex are heard in the right ear; air conduction is absent; bone conduction good; with the left ear closed the Dench whistle is heard throughout the scale. The hearing in the left ear is normal. It is impossible to open the mouth wide enough to examine the oropharynx.

**NOSE.**—The left inferior turbinate and nasal septum are bright red, swollen and lie in contact. The probe shows the tissues are firm and do not pit on pressure, adrenalin and cocaine cause no appreciable shrinkage. Examination of the right side shows the same condition present, except for an area of ulceration on the anterior part of the lower turbinate, probably due to the operation of a week before.

It is impossible to see either of the middle turbinates. Speech is decidedly interfered with and of nasal type. There is no enlargement of the left salivary glands, postcervical, inguinal and epitrochlear glands, nor of the liver or spleen. On the left side of the coronal glandis there is a stellate cicatrix.

The diagnosis of gummatous infiltration of the right parotid and submaxillary glands and of the nasal septum and lower turbinates was made, and ascending doses of a saturated solution of potassium iodide was ordered and Dobell's solution for the nose. The patient did not return until December 18, when he stated he had slept all of the two previous nights, the first unbroken rest for several weeks. The notes made concerning his condition at this visit are as follows:

The mouth opens a little wider and the nasal tissues are beginning to respond to adrenalin; the swelling over the right side of the face is less and the skin is beginning to wrinkle. He is now taking 17 drops of potassium iodide, three times each day. Temperature 98.4°, pulse 76, urine clear, amber color, specific gravity 1022, acid, no albumin, sugar, or casts.

December 26: There is only a slight swelling in front of and below the ear; the submaxillary gland can hardly be felt, there is no pain or tenderness, nasal respiration is not interfered with, the right ear drum membrane is retracted, the cone of light is almost obliterated, the examination of the pharynx and larynx is negative. In the right ear the watch is heard 1/12 and bone conduction is greater than air conduction. The Weber test is heard in the right ear. In the left ear the watch is heard 12/12 and air conduction is greater than bone conduction. After catheterization of the right tube the watch is heard 12/12 and air conduction is greater than bone conduction. The Weber test is not lateralized. He is now taking 18 drops of potassium iodide three times a day.

January 23: There is no swelling over the parotid or submaxillary region. The glands cannot be felt. The nose is now approximately in a normal condition. Both ears respond normally to tuning forks A50, A100, A200, C500, and C2000, Dench whistle and watch. He is now taking 30 drops of potassium iodide, three times a day. Mercurial inunctions were added.

The diagnosis was based on: 1. A history of chancre followed by the secondary symptoms of syphilis which disappeared during a mercurial course. 2. The exclusion of other

known causes. 3. The simultaneous presence of typical gummatous infiltration in the nose. 4. It was confirmed by the result of administering potassium iodid.

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- <sup>3</sup> Cited by Neumann, Arch. fur Derm. u. Syph., 1894, vol. 29, p. 91.
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- <sup>5</sup> Central d. chir., 1875, p. 273.
- <sup>6</sup> Path. u. Therapy der Syph., p. 273.
- <sup>7</sup> Wiener med. Wochschr., 1880, No. 9.
- <sup>8</sup> American Journal of the Medical Sciences, January, 1898.
- <sup>9</sup> Journal of the American Medical Association, xxxvii, p. 450.
- <sup>10</sup> American Medicine, p. 179, 1903.

**CONGENITAL DEFICIENCIES (WITH RADIOGRAMS): CLEFT SACRUM, IMPERFORATE ANUS, ABSENCE OF RADIUS, ABSENCE OF PHALANGES AND METACARPAL BONES OF THUMB ON LEFT SIDE AND METACARPAL BONE OF THUMB ON RIGHT SIDE.<sup>1</sup>**

BY

C. H. MUSCHLITZ, M. D.,  
of Philadelphia.

The following case is reported through the courtesy of Dr. E. L. Meyers, of Wilkesbarre.

The patient, E. R. G., a female, aged 2 months, and of American parentage, was examined by Dr. H. Augustus Wilson and myself. The father and mother are living and well. There is a history of tuberculosis among the paternal relatives, but for deformities and nervous disorders the history is negative. Brothers and sisters are well and present no deformities.

The mother states that during her gravidity, about the seventh month, she fell on a porch striking her abdomen and right hip, following which she had a severe lancinating pain which lasted several hours. Prior to, and after the injury (excepting for the several hours of pain) she says her pregnancy was normal. Delivery was comparatively easy and no instruments were used. She denies having had maternal impressions of any kind. It is interesting to note that the mother believes the deformities of the child due to the fall.

Immediately after the delivery of E. R. G., there was noticed several abnormalities which will be detailed later. From the time of

<sup>1</sup>Read before the Philadelphia County Medical Society, March 13, 1907.

birth up to the visit at our office, which was about two and one-half months ago, she had suffered no illness. She was bottle fed from birth.

Examination: The child was poorly nourished, and a rather fretful, frail infant weighing less than seven pounds. The anterior and posterior fontanels were normal. The



A. Cleft Sacrum.

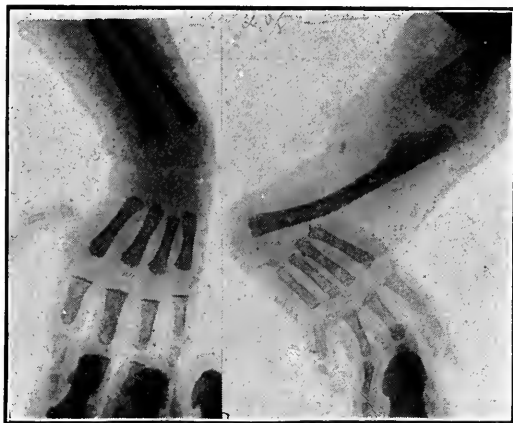
palate presented no deformities, but the frenum of the tongue was rather short. The chest, heart and lungs were apparently normal. The right hand presented a partially amputated thumb which swung freely in all directions, being attached by a thin cord of skin. The corresponding metatarsal bone was absent. There was no muscular control of the thumb but otherwise the movements of the hand and arm seemed normal.

On the left hand there was congenital absence of the phalanges and metatarsal bone of the thumb. The forearm at its lower fifth was bent upon itself toward the radial side almost at right angles. The flexor tendons were very tense and lying on the radial surface. There was slight mobility at the angular deformity, but by the exercise of extreme force an almost corrected position could be obtained. The length of the forearm from the elbow to the deformity was about three-fourths inch shorter than the forearm on the right side. The fingers of both hands were preternaturally long. The articulation at the elbow seemed normal. Further examination revealed a slight dimpling of the skin over the sacrum about its middle. There was no tumor and pressure on the cranium would not cause the appearance of one. It was considered to be a cleft arm and not spina bifida.

The anus was imperforate at its normal

location and a very small aperture was noticed in the posterior vaginal wall at the vestibule. About the vulva there was a slight eczema as a result of irritation from the excretions.

There was slight bowing of both legs and no palsies were noted. The radiograms (by Dr. W. F. Manges) demonstrate the absence of the metacarpal bones of the thumb of both hands. The radius is absent in the left forearm. The carpal bones are



Note description of arms and hands.

not to be seen, but this deficiency is no doubt due to the age of the child, as at two months the carpal bones are not demonstrable by röntgen ray. Pelvic findings show a distinct bone deficiency in the sacral region, and as before described, a cleft sacrum.

Treatment was very limited on account of the child's frail condition. The partially amputated thumb was removed without anesthetic by ligature and the deformity of the left forearm slightly improved by the application of plaster-of-Paris bandage. We were unable to obtain full correction without giving a great deal of pain, and as the child was unable to take an anesthetic the deformity was only slightly diminished. We deemed it advisable to correct the same gradually by the application of casts. If this did not succeed, tendon lengthening would probably be resorted to.

The rectal condition was examined by Dr. J. Coles Brick who advised that operation be deferred until the child was five or six years of age, since experience taught that early operations on imperforate ani give very poor results.

About one month ago we were informed that the child had died of some acute affection after being sick for several days. Autopsy was not performed.

## SOME UNUSUAL AND INTERESTING MUSCLE ANOMALIES.

BY

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(From the Laboratory of Anatomy of the Jefferson  
Medical College.)

During the session of 1906-7, my attention was called to a number of interesting muscular anomalies. As these seemed quite unusual a careful description was taken and, as far as

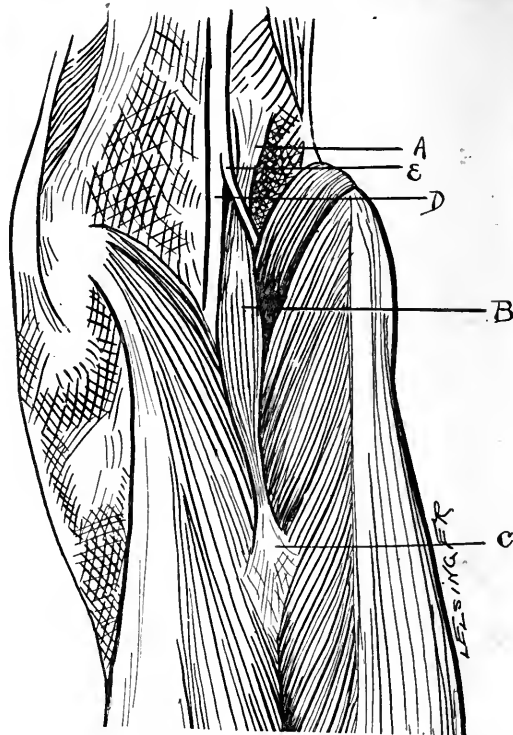


FIG. 1.—Third head of gastrocnemius muscle. A, origin; B, belly; C, insertion; D, internal popliteal nerve; E, external popliteal nerve.

possible, a drawing was made. The subject of muscle variation is a very interesting and at the same time a broad one. A thorough knowledge of comparative anatomy and embryology alone will give an explanation of these peculiarities. The development of the muscles has received especial attention from McMurrich and Bardeen, whose interesting articles have added light to this subject.

### THIRD HEAD OF THE GASTROCNEMIUS MUSCLE.

This anomaly occurred in both of the lower extremities of the same body. That of the right side will be described first. This first or middle head arises from the intermuscular fascia between the semitendinosus and biceps, more towards the former than the latter, at about the junction of the middle and lower thirds of the thigh, at the apex of the popliteal space above the divergence of the biceps and semitendinosus. This origin is a thin, flat head that increases in thickness to form a fleshy belly, circular in outline and about three-fourths of a centimeter in diameter. The

gastrocnemius to blend with the aponeurosis of this muscle. It passes up from the floor of the popliteal space external to the popliteal vessels and between the external and internal popliteal nerves. It is in no way connected with the plantaris muscle.

Henle describes a number of variations of this muscle and those nearest to the above conditions will be mentioned. One case, reported by Halbertsma, showed the inner head of the gastrocnemius divided and the popliteal vessels passed between the divisions. One instance described by Kelch and Classon showed the muscle arising from the inner head of the biceps, while its tendon extended down

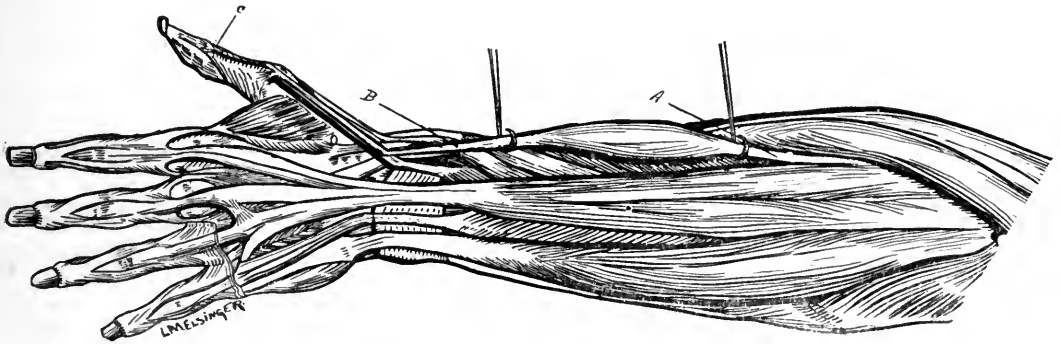


FIG. 2.—Accessory extensor longus pollicis (?). A, tendinous origin; B, tendon; C, insertion.

muscle tapers gradually to end in a tendon at the lower angle of the popliteal space, between the converging heads of the gastrocnemius muscle. The tendon is a slender band about 4 cm. in length that blends with the fascia over the junction of the two heads of the gastrocnemius.

On the left side, the muscle is larger, measuring— $1\frac{1}{2}$  cm. in diameter.

In another cadaver this muscle had a different origin.

This head arises from the periosteum of the femur near the middle of the popliteal space and about 2 cm. above the intercondylic notch, as a flat, thin muscular band  $\frac{3}{4}$  cm. in width. This continues as a flattened belly 1 cm. wide and 11 cm. long and ends in a cord-like tendon, 3 cm. long, which spreads on the aponeurosis between the two heads of the

muscle to the tendo-Achilles. Wood's case was one in which the muscle arose from the femur in the popliteal space and received a lateral tendinous slip from the posterior ligament of the knee-joint. Henle himself saw one instance in which the third head arose between the two heads, more from the inner than the outer and then extended vertically as a cylindric tendon that fused with the narrow tendinous mass between the converging heads of the gastrocnemius.

The first and second of the foregoing cases resemble those of Kelch and Classon; the third resembles that of Wood with the exception that the lateral tendinous slip is wanting.

### ACCESSORY EXTENSOR POLLICIS (?).

This muscle arises from the external condyle of the humerus by a tendon 3 cm. long; this

passes into a muscular belly, about 4 cm. in length, that comes out from the extensor group between the extensor carpi radialis brevis and the index slip of the extensor communis digitorum. It then continues as a delicate tendon that passes beneath the posterior annular ligament and joins the tendon of the extensor longus pollicis below the wrist; it runs in the same sheath with this muscle and is inserted into the base of the last phalanx of the thumb, independently of the extensor longus pollicis.

Henle mentions that a tendon of the extensor communis digitorum may extend to join the tendon of the extensor longus pollicis. Such cases were seen by Wood, Bankart, Pye-Smith and Phillips.

This anomaly differs from those mentioned by Henle in that the tendon does not fuse with that of the extensor longus pollicis and in its mode of origin. It seems more like an accessory extensor longus pollicis.

#### DIGASTRIC EXTENSOR BREVIS POLLICIS.

The origin of this muscle is normal. However, as the tendon reaches the carpometacarpal articulation it passes into a flattened, fleshy belly (3 cm. long by  $1\frac{3}{4}$  cm. wide and 3 mm. thick) that tapers at both ends; this fleshy belly ends in a short tendon that is inserted into the base of the first phalanx. It is entirely independent of the short muscles of the thumb.

No cases similar to this could be found.

#### ACCESSORY PALMARIS LONGUS.

The ulnar muscle arises in the fascia between the flexor carpi ulnaris and flexor sublimis digitorum, about  $2\frac{1}{2}$  cm. below the internal condyle of the humerus, as a spindle-shaped belly  $12\frac{1}{2}$  cm. long, 2 cm. wide and  $\frac{1}{3}$  cm. thick; it ends in a broad, flat tendon at the junction of the middle and lower thirds of the forearm and is inserted into the fascia of the palm.

The radial muscle arises from the condyle and common tendon by a fleshy head entirely separate from the preceding. The belly is flat and tapering, measuring 11 cm. long,  $1\frac{1}{2}$  cm. wide and  $\frac{3}{4}$  cm. thick. It ends in a narrow

flat tendon that is inserted into the palmar fascia and scaphoid bone. It is overlapped by the ulnar muscle.

Gruber found this condition unilateral in twenty-two and bilateral in five out of five hundred cadavers. The accessory muscle is usually superficial and ulnar to the regular muscle (radial in only one instance) and ends in

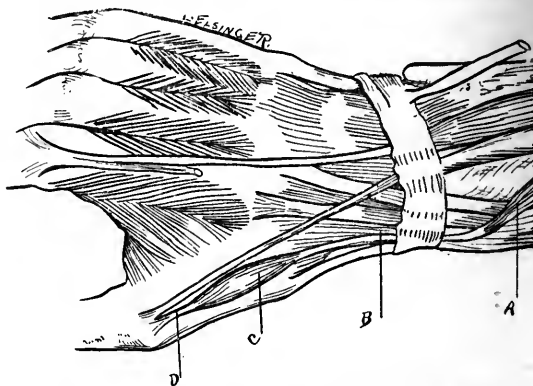


FIG. 3.—Digastric extensor brevis pollicis. A, upper tendon; B, upper belly; C, lower belly; D, lower tendon.

the palmar fascia or that of the hypothenar eminence, or it may take a deeper course and end in the anterior carpal ligament.

A number of cases in which the palmaris longus was absent was noted but this is no unusual condition. Gruber found it absent on both sides in about one-third of the cadavers examined and on one side in about one-half.

The writer wishes to thank Messrs. Doyle, Rosenthal, Hughes, Elsinger, Shaw, and Brock, students who assisted in the dissection of these muscles and Mr. L. M. Elsinger for the capable manner in which the drawings were executed.

### A SANITARY SCORE CARD AS A FACTOR IN THE INSPECTION OF DAIRY FARMS.<sup>1</sup>

BY

ELLIS M. SANTEE, M.D.,  
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Dairy Expert U. S. Dept. of Agriculture.

The dairy score card for valuing, recording, and publishing dairy conditions is being adopted by Boards of Health in cities of all sizes. It is proving invaluable to inspector,

<sup>1</sup> Read at Sanitary Conference, Buffalo, N. Y., Oct. 18, 1907.

producer, vendor, consumer, and Boards of Health alike.

*As an Aid to Uniformity of Reports.*—In the past, too much reliance has had to be placed upon the personal viewpoint of the inspector. Send three men to report upon a place according to the old methods, and one will report it good, another poor, and the other may call it bad, depending entirely upon what each is looking for.

In one city the work of which has come under my personal observation, a number of dairy farmers have been driven out of business because one of its inspectors has an exalted idea of a condition too often found in the spring of the year—a great amount of manure collected in the barn yards. Now this condition counts for only 3 percent in the U. S. Department of Agriculture score card. A man who had gone to much expense to fit up a fine place that scored 76 after he had given up trying to produce a good quality of milk, was refused a license and financially ruined for this reason. Neighbors who happened to have good yards but scored only from 30 to 45 were allowed to continue. An intelligent application of the score card would have corrected each of these abuses, some of which bear heavily upon the individual producer, while others are unjust to the consumer.

*As an Aid to Inspectors.*—A score card tells the inspector what to look for, records in concise and permanent manner what he sees and learns, proves a valuable insurance against successful questioning, by producers, of the justice of his conclusions, and removes sources of difference between them. Thus the efficiency of the work is at least doubled.

*As an Aid to the Producer.*—The score card shows him the requirements, the good and bad points of his establishment, acts as a medium of perfect understanding between himself and the inspector, and furnishes the best producer a means of getting a just reward for his efforts to produce a good article. There was little incentive to the intensely practical farmer to produce a meritorious product while his neighbor was receiving the same price for a

very inferior one. In one city where the price was fairly uniform, one of the best scoring dairy farms which had been getting from 12 cents to 18 cents per gallon for its milk, very soon, after the fact became known that it scored 90 points, entered into a yearly contract at 22 to 24 cents per gallon. Numerous incidents of like results might be cited.

*As an Aid to the Dealer.*—The score card enables the vendor intelligently to select sources of supply, thereby helping the good producer who should be encouraged. The dealer can keep tab on the sources of his supply during the time of the contract, and likewise be furnished with a valid reason for any objection that he may raise in a contention with the producer.

*As an Aid to the Consumer.*—A score card enables the consumer to comprehend the conditions surrounding the sources of his own supply without visiting the place, which is seldom done.

*As an Aid to Boards of Health.*—Boards of Health adopting the use of the score cards can not only keep posted as to dairies, but also as to the work of the inspector. The card is a guarantee against partiality on the part of the inspector. The report is written and a mistake stares him in the face forever.

*As a Stimulant to the Spirit of Emulation.*—The inevitable result of the use of the score card is the premium in price to the producer furnishing the best milk. In places where the system has been followed for any length of time the score of the average dairy increases each year, and the use of the card has been satisfactory to all concerned.

*Methods Generally Adopted.*—After tactfully acquainting the producer with the object of his visit, and getting matters upon a mutually agreeable footing, the inspector looks over the herd with special reference to the general condition, cleanliness, and outward evidences of disease. The ones most often found are udder troubles, labored breathing, and those disturbances indicated by dulness of eyes. The stables are examined with reference to location, cleanliness, purity of air, the presence

of other animals, and general arrangement for comfort and health of the cows, such as floor, bedding, light, ventilation, amount of air-space, food and water. Dust-catching ledges are scored as defects.

The milk room is inspected with reference to location, equipment, cleanliness, light, ventilation, freedom from flies, and construction of floors, ceilings, and sidewalls.

The utensils are scored with reference to construction, cleanliness and care after cleaning. To get a correct estimate of the method of cleaning utensils, milking and cooling the milk without being present when the work is being done, will many times require the skill of a trial lawyer. It is usually better to ask for the description of methods than to use direct questioning.

After the score is completed, if each point is explained to the producer much misunderstanding may be avoided. If possible he should be made to feel satisfied with his score. The success or failure of any inspector may always be gauged by the frame of mind in which he leaves the producer; and, while he should have the power to suspend a license temporarily, he should seldom use it. When police work is needed a letter from the office usually brings the offender in, and a heart-to-heart talk with the chief inspector or the health officer usually has the desired effect.

*Publicity.*—The most effective weapon any health officer ever had in his warfare upon filth and disease (if judiciously used) is publicity; and the safest and most reliable medium for publication is the score card. A dairyman can always fight if you attempt to deprive him of his license—and he usually does—but when he drives up to house after house only to be told that his customers do not want any more of his milk because they have seen his sanitary score and found that his methods are bad, he usually gets very busy. It is always best at first to publish only the higher scoring places. The poorer ones are easily picked out by their absence from the list, and most of them will mend their ways that they may

appear in the next list. It is well, also, to give notice at the time of the publication of the first list that at a certain time another score will be made and at this time all scores will be published. The slovenly dairyman cannot long withstand publicity.

## CLINICAL NOTES.

### INTUMESCENCE OF THE LOWER TURBINAL. A SAW-KNIFE FOR ITS REDUCTION.

BY

J. G. PARSONS, M. D.,  
of Brookings, S. D.

In normal breathing the inspired air enters the nose where it is heated, moistened, and filtered in preparation for its entrance into the lungs. If the nasal passages are inadequate or occluded, mouth-breathing must follow, with accompanying irritation of the throat and exposure to infection.

The turbinals, which are chiefly concerned in heating and moistening the air, are masses of erectile tissue surrounding the turbinated bones, and are covered with mucous membrane richly supplied with glands, many of which dip deeply into the underlying cavernous



tissue. The cavernous spaces, when distended with blood, radiate sufficient heat to warm the air which passes over them, and also assist in moistening the air by transpiration. The nasal secretions have an inhibiting effect on the growth of germs which are caught in the nasal filter.

It is evident, therefore, that in order to serve its normal purpose as an organ of respiration, the nasal cavity must be of sufficient caliber to carry the proper amount of air and must have an adequate amount of normal secretion. Under varying conditions of irritation a state of chronic congestion arises. The venous spaces of the erectile tissue of the turbinals are distended and their walls lose their elasticity. In this manner, the turbinals take on a form of chronic enlargement. This state of intumescence, if maintained, tends to develop into a true hypertrophic condition, characterized by the proliferation of connective tissue, thickening of the mucosa and bony structures.

When the swelling is large enough to bring

the turbinal and the septum in contact, conditions arise which further complicate the morbid state already present. Ventilation of the nasal chambers is interfered with, rendering the sinuses liable to involvement. The secretions which accumulate at the point of contact decompose and further irritate the mucosa. Reflex nervous disturbances from pressure on the nerve supply of the septum are noted. Asthma and hay-fever dependent on such reflex irritation are not infrequently met. The local treatment required in such cases is the reduction of the turbinal to normal size. This relieves the pressure on the irritated nerves, prevents the accumulation of nasal secretions, permits free ventilation of the nasal chambers, and, what is still more important, helps establish normal nasal breathing. Examination of the nose will show swollen turbinals which yield to pressure with the probe and which may be contracted by the application of cocain and adrenalin.

The methods of treatment of these cases have been chiefly cauterization, by means of acids or electrocautery, or excision of a portion of the turbinal. These methods, while accomplishing the desired results are open to serious objection because of the harm they do. The mucous covering of the turbinals has an important function and should not be needlessly destroyed. The cautery operation destroys a portion of the mucosa and leaves a slough which takes some time to heal, beside being painful and disagreeable to the patient. Excision is much more surgical, but is also open to the objection that it removes a portion of the mucosa. By the ordinary method a week or ten days is required for healing the cut surface, and there is also some danger of synechia. This was obviated by Yankauer in his operation in which sutures are introduced, bringing the edges of the mucosa together.

A third method which has been uniformly successful in my hands is that of submucous destruction of the distended venous spaces with a saw-knife devised for the purpose. The nasal cavity is sprayed thoroughly with a cleansing solution, after which local anesthesia is established. The site of the puncture to be made is rendered as nearly aseptic as is possible. The point of the saw-knife is inserted into the intumescent turbinal and carried back as far as possible, hugging close to the bone. A few sawing sweeps of the knife are made, breaking down as much as may be necessary of the erectile tissue, and the knife withdrawn from the opening. The nose is packed with com-

pressed cotton tampons which are left in place for two days. When removed, the turbinal will be found to be permanently contracted.

The advantages of this operation are:

1. It is easily performed, taking but a moment's time.
2. It is practically painless and is accompanied by little or no shock.
3. Healing is complete in two or three days.
4. There is no destruction of mucous membrane.

Obviously, this operation is suitable only for intumescent cases, before fixed hypertrophy has developed, when excision is the thing. In view of the great prevalence of this condition, the ease with which it can be remedied by operation, and the beneficial results which follow treatment, I believe there is a wide field of usefulness for this operation.

My original report of the use of the nasal saw-knife, made in the *Journal of the American Medical Association* was illustrated by a crude sketch of an instrument of my own making. This has been copied by an eastern instrument maker, who made the knives in right and left. But one knife is necessary for either side. A very satisfactory model of the improved shape is made by F. A. Hardy & Co., of Chicago, to whom thanks are due for making the instrument and for the use of the cut illustrating this article.

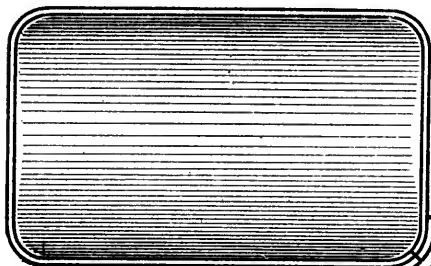
## DOUBLING THE READING POWER IN AM- BLYOPIA BY THE CROSSED-CYLINDER "READER."

BY

GEORGE M. GOULD, M.D.,  
of Philadelphia.

It is painful and astonishing to learn how great is the number of patients with incurable dimness of vision handed down to us by a medical generation sinfully indifferent to life's most precious thing, the good vision of patients. Scientific spectacles were necessary to preserve the all-important visual acuteness, but such spectacles were sneered at as proofs of exaggeration and faddism. Eyes were allowed to become strabismic and thus half or wholly blind; the retinal sensitiveness was ruined because "astigmatism, too little to correct," was ignored; ocular disease was permitted because it was not thought worth while to prevent it; corneas were clouded with leukomas because keratitis, conjunctivitis, blepharitis, etc., were without causes and not to be prevented—and so on, and so on.

All this time the great leaders said ametropia and eyestrain caused no ocular or systemic diseases, and that the only need of correcting the ametropia was to secure better vision; and all this time these leaders did not better vision but worsened it in millions of patients treated, mistreated, and not treated. In a



great "civilized" nation thousands of patients today are made to sit while hot steam is blown upon their eyes, first inflamed because of uncorrected ametropia. The ametropia is ignored, the hot steam cannot cure. In another less "civilized" country the great little leaders of little great ophthalmologic societies, and the little little editors of ophthalmic and other journals enter into a conspiracy of silence to increase the ocular diseases they are officially supposed to cure, and to prevent.

So the past is the present, because the amblyopia of these patients is being created to hand down to the coming generation.

The greater part of the affliction of these pitiful victims of prejudice and unscience consists of inability to read the usual sized print of newspapers and books. Those who have made them half-blind will, of course, have no interest in lessening their infirmity or bettering their lot. If it is suggested to them, they may assent languidly to the use of a "reading glass." But the needed correction of astigmatism and anisometropia will not have been seen to in advance. And the reading glass will be a huge or a tiny biconvex lens which, while it magnifies a little the sizes of the letters, will much more distort the images, thus adding to the ocular strain.

For some years I have been in the habit of giving amblyopic patients, when their deficient acuteness is not too great, a much-increased ease and length of time of reading by means of a rectangular crossed-cylinder lens about  $3 \times 4$  inches. This device, the product of the French workshops, magnifies uniformly the

entire line of type, and without distortion. It is so light that it may be held for a considerable time in the hand without fatigue, and is placed between the eyes and page at the proper focal distance. It is most helpful to those having a visual acuteness of from 20/50 to 10/200, enabling them to do at least two or three times more reading and in many cases to read print before indecipherable.

Plans are also under way to place the lens in a stationary holder adjusted to the position of the head or body chosen, and without holding it with the hand. This device may be attached to the chair, or fixed in a stand upon the floor by the chair. In this way even sewing might be made possible.

The usual method of constructing these lenses is with the handle inserted in the center

of the longer side at right angles to it; but this compels a cramped and fatiguing position of the grasping hand. I have asked the opticians, Messrs. Wall and Ochs, of Philadelphia, to have a supply so made that the handle is inserted as shown in the annexed cut, whereby it is held in the proper position more

easily and longer. The frame enclosing the lens, as well as the handle, is dull black, differing in this respect from the bright metal commonly employed. The handle is octagonal so that it is held more easily in the hand than if it were made round. It has proved to be a most helpful instrument for those in the plight described.

**Further Donation for Johns Hopkins Hospital.**—Henry Phipps, of Pittsburg, has given Johns Hopkins Hospital an additional donation to enable further research work in the tuberculosis dispensary of the hospital which he endowed two years ago. The amount of the gift has not been disclosed. Mr. Phipps already had given the hospital \$20,000 to establish a tuberculosis dispensary.

According to a German physician, Dr. Horn, miners age so rapidly because of their unhygienic surroundings, that they present all the aspects of senile decay at the age of fifty, beyond which few are able to ply their vocation.

## DIGEST OF LITERATURE.

### PNEUMONIA.

BY

THOS. STOTESBURY GITHENS,  
of Atlantic City, N. J.

The increasing prevalence and mortality of pneumonia have awakened universal interest in the disease, and greatly stimulated experimental study in regard to its incidence and pathogenesis. Although bacteriologists do not wholly agree that even croupous pneumonia is a truly specific disease, it seems to be well established clinically, that so far as man is concerned, the exciting agent is almost always the pneumococcus of Fränkel. In the last few years several observers have been working with this organism, in an attempt to determine positively its relation to man. As is well known, it is frequently found in the mouths of healthy persons, and is almost constantly present in expectoration, from whatever cause. It is also found among the domestic animals, being reported in the saliva of various animals by Barthel,<sup>1</sup> Calamida and Bertarelli,<sup>2</sup> Beco,<sup>3</sup> Boni,<sup>4</sup> Klipstein,<sup>5</sup> and Palier.<sup>6</sup> There is a great difference in virulence between different strains of the organism, and Longcope<sup>7</sup> has studied the pathogenic power of organisms from various sources. He found pneumococci 35 times in the saliva of 42 healthy persons. Of these 19 showed typical diplococci and 16, a form related to the pneumococcus, but with more tendency to the formation of chains and less to capsulation. Their virulence was very low. There was a marked difference in the comparative number of the diplococci and streptococci types, according to the time of year. Between December and February, 17 salivas showed 13 diplococci and three streptococci, between March and November, 25 showed six diplococci, 13 streptococci and six negative. The sputum of pneumonia cases showed diplococci which about equalled those from the mouth in toxic power. The only organisms which showed a high degree of virulence, were those obtained in connection with suppuration.

Most of the attempts to produce lesions in lower animals, like human lobar pneumonia, have ended in failure, unless factors were introduced which hardly ever come into play in man. Wadsworth,<sup>8</sup> however, has succeeded in producing such lesions in a way which seems entirely probable as at least one of the ways in which man may contract the

disease. He found that if cultures of high virulence were placed in the trachea of animals which had previously been partially immunized by the injection of strains of low virulence, a typical lobar pneumonia was almost constant. Animals treated in the same way but not immunized, died of septicemia and showed no lesion of the lungs. The organisms in the saliva of normal persons and in pneumonic sputum are not of sufficient virulence to cause disease in immunized individuals, and it does not seem probable that enough cocci from suppurative processes could be found, to account for all cases of pneumonia. The origin, or at least a possible origin, of such virulent forms has been discovered by Palier,<sup>6</sup> who during some experiments found that mice, and especially the common gray mouse, are very susceptible to the action of the organism, and that the cocci recovered from infected mice are possessed of a high degree of virulence. The constant presence of the organism in the human respiratory tract explains the immunity enjoyed by most persons and also the occurrence of pneumonia rather than septicemia, when infection with virulent strains occurs. The reference of the disease to infected mice, may also explain the occurrence of house and room epidemics, without any contagion from human cases. The extreme rarity of such contagion in spite of constant exposure, has long been the strongest weapon in the hands of those who deny contagiousness. Palier's theory is also upheld by the fact that pneumonia is most frequent in the winter months, when the mice are most abundantly present in houses and by its especial frequency in March when there are many young mice, these being especially susceptible. Palier believes that the pneumococcus acts as a protective agent against other germs, which apart from its presence would find an easy lodgment in the respiratory tract. The tendency of the pneumococcus to the production of acid, favors this view, as most pathogenic organisms are inhibited by acidity and we find a perfect analogy in the acid secretion of Doederlein's vaginal bacillus, the presence of which is universally acknowledged to be protective. The production of acid in persons suffering from pneumonia, has been shown by Longcope and Washburn<sup>9</sup> who found that when pneumococci were grown in serum taken from pneumonic patients, the serum became acid and thereby caused a precipitate of a nuclealbumin which is not present in

normal blood. (Nucleoalbumin appears in the blood after hemorrhage and as these patients had been bled before the blood was taken for these experiments, it is not necessary to look upon its presence as in any way peculiar to the pneumococcic infection.) Cocci grown in normal serum or that of patients with other diseases, produced no acid in appreciable quantities, the reaction of the serum remaining alkaline. The authors also examined pleural and meningitic exudates and found the former actually acid in one case. The latter was merely reduced in alkalinity. The nature of the substance from which this acid is produced is not yet certain, but it appears to be a carbohydrate different from glucose. Rosenberger<sup>20</sup> reports finding a similar body in the urine in cases of pneumonia. Its exact nature was not determined.

Until recent years, the responsibility of the pneumococcus for original lesions elsewhere than in the lung was not fully appreciated. The organism figures prominently, however, in all tables of infectious agents, especially those causing inflammation of serous membranes. Thus Wheelock<sup>11</sup> reports an infection of a nasal sinus, followed by arthritis, Herzog<sup>12</sup> quotes 20 cases of arthritis without lesion of the lung, Ashdowne<sup>13</sup> reports a case of primary peritonitis, Lloyd<sup>14</sup> found the pneumococcus as the causative agent in 17 of 159 cases of puerperal sepsis, Annand and Bowen<sup>15</sup> report cases of primary peritonitis in children, Marchisio<sup>16</sup> saw five cases of gastroenteritis with ulceration, Netter<sup>17</sup> found the pneumococcus 43 times in 60 cases of meningitis, Southard and Keene<sup>17</sup> report 12 cases of infection of the brain substance, of which only two were subsequent to croupous pneumonia, Darling<sup>18</sup> saw 12 cases of primary meningitis. Many others report similar cases. These studies are of great interest in connection with the attempt now being made to overthrow the old idea of a soluble toxin circulating in the blood, and to replace it by ascribing all symptoms to the presence of the bacteria in the substance of the affected organ. The Klemperers, many years ago, found that they were able to protect rabbits against infection by the injection of filtered media, in which pneumococci had been grown. These results have been assumed to show the existence of a soluble toxin, capable of producing immunization when injected, and the idea that the effect of the infection on the heart was due to the presence of this toxin in the blood has obtained general acceptance; but Levy and

Steinmetz<sup>19</sup> repeated the work of the Klemperers, and found that no febrile reaction, such as one expects after injection of potent bacterial toxins, followed these injections. Thinking that the toxin might be formed *in vivo*, only, they injected the macerated and filtered spleens of animals dying of pneumococcus septicemia, but again had no reaction. As such injections caused an immunity, which as in Klemperer's experiments, reached its height several days later, they sought an explanation and finally found it in the leukocytosis which follows any such injection. The immunity produced by the injection of any antitoxin, or even nuclein, was as great as that produced by the filtered cultures. The conclusion that the pneumococcus produces no soluble toxin is inevitable. The results of antitoxin treatment seen by Tartaro<sup>20</sup> agree with this view. There was no effect on the local lesion, which would be beyond the reach of the leukocytes, nor on the duration of the disease, but a marked improvement in the systemic condition (bacteremia). Although as stated by Weaver,<sup>21</sup> there is no record of pneumococci having been found in leukocytes in the blood, the researches of Rosenow<sup>22</sup> show that weak strains of the organism are taken up and destroyed by phagocytes *in vitro*. Pneumococci taken from patients near the crisis, were not attacked. The reason for this is not clear. The familiar experiments of Paessler and Rolly<sup>23</sup> showed that the primary action of the pneumococcus on the circulation was central paralysis of the vasomotor center in the medulla, and it seems probable that this effect is due to the presence of the organisms, themselves, in the nerve tissue, and as the autopsy reports of Southard and Keene<sup>17</sup> show that the pneumococcus may penetrate the brain tissue, it is reasonable to suppose that it acts by direct irritation. Preble,<sup>29</sup> in 1905, stated that no careful studies of the blood-pressure in pneumonia in man, had yet been made, and that this study was of great importance in connection with the results of animal experiments. This gap in our knowledge has been filled by Brem,<sup>24</sup> who in a very noteworthy paper gives the results of his clinical observations in the disease. He has found that the first effect of the pneumococcus is stimulation of the respiratory center. This is shown by increased frequency of respiration, use of the accessory muscles, and playing of the alæ of the nose. These effects, which as he remarks, are exactly analogous to those seen on electric stimu-

lation of the center in lower animals, show themselves before the pulmonary lesion is sufficient to cause any dyspnea. At about the same time, he notes a marked increase in the force and frequency of the heart's action, and a very marked rise in blood-pressure, especially systolic pressure. These effects are again the same as those seen on electric stimulation of the corresponding centers. The rapid respiration soon leads to dyspnea, as it is evident that the more rapid the respirations, the shorter and therefore the shallower, will be each one. In a prolonged inspiration followed by a long expiration, almost all the air is emptied from the lungs and it is evident that the air last expelled is that from the alveoli, which being the respired air is that which we wish particularly to renew. Now it is evident that as the breathing becomes more shallow, the expired air contains a larger and larger proportion of air from the trachea and large bronchi, and a smaller amount from the alveoli. The air actually renewed is thus particularly lessened by rapid respiration, and the marked dyspnea of the early stages of the disease is thus explained by overstimulation of the respiratory center. As the disease progresses, this overstimulation gives place to exhaustion, which first affects the vasomotor center, but may affect the cardiac and respiratory centers, slow pulse and respiration being occasionally seen in severe cases with marked exhaustion. The first sign of exhaustion is always a fall of the peripheral blood-pressure, and the effect of this is so intense that it overshadows all the other phenomena of exhaustion. As Hare<sup>25</sup> has recently remarked: "It is not uncommon to find in these patients at this time, a state bordering on collapse. The face is anxious, the forehead, wrists and trunk bedewed with sweat, the pulse very full, but the arteries relaxed, and the heart's action excessive, as it actively endeavors to fill the leaking vessels, which do not offer the normal resistance to its action. This state depends chiefly, if not entirely, on vascular hypotonus." In some cases it would seem, however, that the overstimulation of the heart showed itself by exhaustion of this organ, independently of the fall in blood-pressure. This seems to be true of those especially whose hearts are naturally excitable, and who react excessively to all cardiac stimulation. Such a tendency to overaction of the heart under small provocation, is spoken of by Shultz,<sup>26</sup> who finds it especially characteristic of athletes and men of the athletic

habit. He believes that the condition is congenital, and that it is the cause and not the effect of indulgence in athletics. This is of great interest in view of the high mortality from pneumonia among athletes and those of particularly strong physique, which has long been recognized. Recently Coughlin<sup>27</sup> investigated 128 deaths among athletes, of which 48 were due to disease, and of these, seven to pneumonia. He concludes that athletes are especially susceptible to pneumonic diseases. The high mortality among alcoholics may be partly due to the same cause, although it is probably due, in part, to the paralyzing influence of alcohol on the phagocytes. Rubin<sup>28</sup> found that in the strength of 1 to 500 it suspended phagocytosis of pneumococci, *in vitro*, completely, and disturbed it, in a strength of 1 to 1000.

When we approach the treatment of pneumonia, we find ourselves on difficult ground. It would seem, that all writers on the subject of the treatment of pneumonia might be divided into two groups, those who claim that treatment is entirely unavailing or almost so, that, at any rate, drug treatment does little if any good; and those who claim that one line of treatment is of the greatest advantage, and saves more cases than almost any other. When these two groups are studied more closely we find that judgment is still more difficult, as almost all the teachers and leading authorities of this country are among those who claim that treatment is of little or no use, and those who advocate special methods of treatment are, as a rule, men of less generally acknowledged authority. Although the authors of the first group admit that little or no benefit is to be derived from treatment, they all recommend some medication, and the striking fact is soon evident, that all, with hardly an exception, condemn the use of heart sedatives, and recommend the use of stimulants. Osler, Tyson, Preble, Anders, Hughes, Sailer, Chardard, Henry, Loomis, Hare, Fränkel, and many others advise the use of stimulants and condemn the use of antipyretics and cardiac sedatives. The use of the various stimulants is as remarkable as it is variable, Henry<sup>30</sup> counsels the use of nitroglycerin and condemns that of ammonium, Elsner<sup>31</sup> condemns nitroglycerin and recommends ammonium. Henry and Osborne<sup>32</sup> and in fact most authors, advise the inhalation of oxygen, Brem<sup>24</sup> as strongly condemns it. All these authors report a mortality varying from 20 to 60 percent. When we turn to the other, the smaller and

less authoritative group, we find a much more hopeful state of affairs. All the members of this group are convinced that their treatment saves life, and a comparison of their results would lead us to think they are right. The much abused antipyretics are used as the standard treatment by Pulverenti, of Italy, and by Smithwick,<sup>33</sup> of Brooklyn. The former reports 106 cases, 40 of which were aborted and the mortality among which was very low. The latter reports 57 cases with three deaths. Stephens,<sup>34</sup> of Iowa, reports 53 cases of pneumonia with three deaths, two senile, one alcoholic. Stepp,<sup>35</sup> of Nurnberg, reports 48 cases treated with fluoroform, with one death. Mays,<sup>36</sup> Northrup<sup>37</sup> and other authors report very favorable results from the use of cold air and cold applications, with no stimulants, and a number of men in the western part of the country have abandoned all stimulant treatment and use quinin with brilliant results. This in spite of the fact that Pulverenti says that all drugs which have a dilating action on the bloodvessels should be avoided, especially quinin.

In the face of such utter divergence of opinion we stand for a moment helpless. The only fact which shines out of the darkness, is that all authors whose standard treatment is cardiac stimulation, whether they favor alcohol, strychnin, digitalis or nitroglycerin, report a mortality of over 20 percent, while all those who favor heart sedatives or nonstimulating vasodilators, such as quinin, report a mortality of less than 10 percent. The only notable exception, so far as I am aware, is Petresco, who gave digitalis in such massive doses that he obtained overstimulation and depression.

It is evident that the treatment of pneumonia needs a complete revision, and that it is not safe to accept any statement with regard to treatment, if this is based on purely clinical data. If we consider the pathologic physiology of the disease, we find the following conditions: Stimulation followed by overstimulation, of the cardiac, respiratory and vasomotor centers; bacteremia, and bacteria localized in various organs; alteration in the composition of the blood, increase in density and fibrinogen, and decrease in alkalinity. As secondary factors we have insufficient oxidation of the blood, due to increased rapidity of respiration, and disproportion between the amount of blood and the size of the bloodvessels. There is probably no bacterial toxin in solution in the blood. Of course, other factors demand treatment, such as pain, delirium, and especially constipation and intestinal putrefac-

tion. These, however, are not part of the pathology of the disease as such.

Taking up the foregoing indications in order, it would seem entirely logical that central stimulation is not indicated in a disease, the principal feature of which is central overstimulation, and the mortality statistics bear out this view. We are therefore led to the use of peripheral stimulants when such are required, and chief among these are heat and cold. All authors, without exception, who have used cold either locally to the chest wall, as advocated by Mays, or universally as championed by Northrup and by Baruch, report good results, and most authorities approve, also, of the poultice, which has much the same effect, stimulating the vasomotor, cardiac and respiratory apparatus, peripherally.

If we accept the idea that the heart failure of pneumonia is due to overstimulation and not to immediate depression, it is at once clear that those drugs, which act as central stimulants to the vasomotor and cardiac apparatus, will hasten the exhaustion of these centers even though they may appear to do good at first. The fact that a treatment which gives brilliant results in the hands of one observer, fails entirely with another, should not lead us too rapidly to the conclusion that the first is overenthusiastic. It may be, and probably is true in many cases, that some detail of the first method which seemed unimportant may have been omitted by the other. The use of quinin has been given up by many who have tried it, but we find as a rule that they have used it in very much smaller doses than those recommended by its champions. This difference is well illustrated by a comparison of Stephens, who has used veratrum in pneumonia for 40 years and has never seen a death when it was used freely from the beginning, with Elsner, who says: "Never have I seen a case of pneumonia recover, which has been rigorously treated with veratrum viride." It seems as if such a difference of opinion as this is due to something more than chance. Elsner condemns almost every drug which is recommended by others. "It is never safe to give any drug which is a cardiac depressant." "Van Santvoord's beautiful tracings prove the baneful effects of nitroglycerin," etc.

The question of the use of veratrum, antimony, and aconite, as well as the antipyretics, has developed into a war of words, their opponents referring to them as "depressants," and their champions as "sedatives." From the physiologist's point of view, the only depression

which does permanent harm, is that which accompanies exhaustion, and it seems that any drug which causes an organ to do more work, would hasten its exhaustion, any influence which lessened its activity, would delay it. Looked at in this way, it would seem that cardiac and vasomotor sedatives are indicated at any time when the heart is using more force than is absolutely necessary to drive the blood through the vessels. Cyanosis and fluttering pulse would indicate their withdrawal. There is no evidence that the effects of sedatives last after their withdrawal. After the centers are exhausted and the vasomotors are relaxed, the heart irregular and laboring, the respiration panting, and the entire economy suffering from the effects of too much stimulation, what can we do to fulfil our indications? As it is almost impossible to force the exhausted vasomotors to contract sufficiently to fit the blood, we are forced to use our efforts in the other direction and increase, artificially, the amount of blood. This we can readily accomplish by hypodermoclysis, which is rapidly gaining favor as a means of combating the tendency to heart failure. The slowing of the heart which follows this is sometimes very remarkable. The cyanosis disappears, the respiration becomes easy, and the patient feels immediate relief. This almost exhausts the measures which can be safely used for the relief of the respiratory and circulatory systems. The bacteremia should however be combated by artificial leukocytosis, induced by the injection of antitoxins or other forms of nucleins. It is to be remembered that the condemnation of heart stimulants does not apply to septic or other pneumonias not typical pneumococcus infections, but only to typical croupous, pneumococcus pneumonia.

The logical treatment of cases of this sort may be summed up as follows: If the heart is acting with more force than is absolutely necessary to drive the blood through the vessels, give some form of heart sedative, until its force is sufficiently reduced. If the blood-pressure is low, apply cold or heat, either to the chest or to the entire body. The effects of each of these procedures seem to be about the same. At the same time give a hypodermoclysis, or if preferred a high enema of normal or slightly weaker salt solution, with a small amount of sodium bicarbonate, to combat the acidity of the blood. From the beginning, the use of measures to increase leukocytosis is indicated, either the injection of antitoxins or serums, or the administration of nucleins,

if this has sufficient effect. The use of heart stimulants, before the crisis, is to be strongly condemned, as although it seems to increase the heart's action and to cause an improvement in the condition of the patient at the time, it does so at the expense of hastening the impending exhaustion, and frequently causes a fatal collapse at or near the crisis. The only possible use for heart stimulants before the crisis is in those chronic alcoholics whose normal condition is one of alcoholic influence. In such cases alcohol loses to a great extent its stimulant action, but it must be used with great caution because of its paralyzing influence on the leukocytes.

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## RECENT EDITORIAL OPINIONS.

**The Journal of the American Medical Association.**—**EXPERIMENTAL STUDY OF TOXIC ANEMIA:** Certain poisons of the general character of toxins and of the chemical constitution of lipoids have been found in cobra venom, the secretion of bees and certain arachnids which by combination with lecithin become marked hemolytic agents. Similar substances have been obtained from the extracts of various mammalian organs, the blood-serum and the juice from a pancreatic fistula. They may cause so much destruction of red cells as to cause anemia. Tallqvist has obtained a similar substance from *Bothriocephalus latus* with which he produced severe anemia in animals both by injection and by feeding and which he considers the probable cause of bothriocephalus anemia. Morgenroth and Reicher in experimental work with these substances demonstrated that cholesterin prevents the development of anemia when introduced in suitable quantities into the stomach of treated animals. The use of cholesterin in parasitic and other anemias is therefore given a rational basis.—**TETANUS BACILLI IN THE HUMAN INTESTINE:** Tetanus bacilli are found according to some investigators in 50 percent of samples of fecal matter from horses. They are obtained probably from hay and grass. Less well known is the fact that the feces of normal men may contain tetanus bacilli or spores in about five percent of cases (Pizzini). The source of these bacilli seems to be in uncooked vegetable food. The defensive mechanism of the human digestive tract seems to be adequate to prevent infection, the chief defensive agent being according to Rabinowitsch the hydrochloric juice which, when present in normal amounts, is capable of depriving the bacilli of their virulence and of destroying their toxins.—**SECONDARY TUMORS OF BONES:** Pathologists have recently learned several interesting facts concerning the developments of secondary tumors of the bones that should be appreciated by clinicians. E. Fränkel discovered metastasis in the bones in 20 percent of all cases of carcinoma coming to autopsy, and Fischer-Defoy in 25.7 percent. Cancer of the prostate has a remarkable tendency to cause extensive secondary invasion of osseous system while carcinoma of the breast is followed by metastasis in the bones with considerable frequency. Metastasis also occurs, but less frequently, in malignant growths in the thy-

roid, the pancreas, and in hypernephromas. In the latter condition, commonly, the first evidence of the growth is a metastatic bone tumor. These tumors in the bone usually cause much more enlargement and bone destruction than do the secondary carcinomas and therefore are much more prominent clinically.—**TESTS FOR OCCULT BLOOD:** A recent article by Goodman tends to confirm the conclusion drawn from other recent researches as to the relative value of the different chemical tests. The benzin test, while far the most delicate, reacts to a number of other substances. A negative test is however positive proof of the absence of blood. A positive benzin test may be checked by aloin or guaiac.—**CANCER OF THE HEAD AND FACE:** From recent statistical studies on epithelioma of the head, face and neck, the following facts are brought out. Cancer of the scalp, temples and forehead is more common in women, while cancer of the external ear, of the cheek and especially of the lip is more common in men. The relative frequency of epithelioma in these situations in the two sexes can probably be explained, according to the investigators, on the ground of relative exposure to trauma. Superficial cancer, in general, occurs more frequently in the poorer class of patients. Carcinoma of the lower lip is far more dangerous than cancer of any other part of the head and face, and its removal is apt to be followed by local recurrence in and about the scar much more commonly than in the glands.—**CHRONIC POLYCYTHEMIA WITH CYANOSIS AND ENLARGED SPLEEN:** Since 1902 several cases of this condition have been reported. The striking features of the disease are chronic cyanosis, changes in the blood, enlargement of the spleen and the hyperplastic marrow of the long bones. The apparent cyanosis is the result of dilation and overfilling with blood of the smaller cutaneous vessels. The blood shows an increase in all the cells normally present, especially the red blood-corpuscles, this increase being associated with a corresponding increase in hemoglobin. The viscosity of the blood may be from three to four times greater than normal, probably due to the increase in the number of corpuscles. Hypertrophy of the heart, increased vascular tension and hemorrhages are caused by the viscosity. At present the disease is best explainable as the result of a primary diminution in the absorption of oxygen with secondary hyperplastic changes in the bone marrow and a resulting compensatory increase in the formation of red corpus-

cles. As to treatment venesection and inhalations of oxygen have been followed with good results.

**Medical Record.**—**THE ACTION OF CHRYSAROBIN ON THE KIDNEYS:** Though chrysarobin is used extensively in various skin diseases, especially psoriasis, the question as to whether it is absorbed, and, if so, whether, it causes any renal disturbances, is still undecided. Few and only uncertain opinions appear in the literature on the subject. Winkler, from experiments on rabbits and man, has shown that chrysarobin is absorbed only when given internally and even then does not cause nephritis, though he recommends examination of the urine before and after using it in the treatment of psoriasis. —**ANGINA PECTORIS AND ANGINOID CONDITIONS:** Schmoll has pointed out that numerous motor, sensory and vasomotor symptoms occur in angina pectoris, which correspond to the peripheral zones which themselves correspond to definite spinal segments. Certain of these disturbances in the author's opinion are due to reflex stimulation of separate spinal segments through the filaments of the sympathetic nerves entering the cord at these levels. The sensations are projected to the periphery and are experienced in the area corresponding to the spinal segments. Anginoid symptoms must not themselves be regarded as definite evidence of coronary arteriosclerosis for they indicate simply the response of the nervous system to disease of the left side of the heart. —**THE PERIOD OF INFECTION IN TYPHOID FEVER:** As the result of an analysis of the conditions encountered in 600 cases of typhoid fever, Conradi has reached the conviction not only that infection is transmitted most often during the earliest days of the disease, but also that it probably frequently takes place during the period of incubation, since the bacilli are already in the blood at this time and are, or may be excreted while the individual is still apparently in good health. These views should act as incentives to greater thoroughness in the application of prophylactic measures. —**ELECTRIC NARCOSIS:** Several months ago Dr. M. Stepane Leduc of Nantes announced the results of experiments he had been pursuing in regard to the production of electric narcosis. He means by the term electric narcosis, a state analogous to chloroform narcosis and declares that this state, produced by the action on the brain of a definite electric current can be maintained for several consecutive hours and ceases immediately with stoppage of the cur-

rent. The awakening is instantaneous, there are no after-effects, no vomiting, rarely a little stupor. Experiments with animals are in a high degree successful. Up to the present time only one experiment on cerebral inhibition has been tried and that was on Dr. Leduc himself. The result of these experiments would seem to teach that electric narcosis is well within the province of practical medicine, and to demonstrate the value of the interrupted current. —**ARTIFICIAL PNEUMOTHORAX IN PULMONARY TUBERCULOSIS:** Since Forlanini in 1894 reported the use of this measure in the treatment of one-sided tuberculous processes of the lung, other clinicians have tested the therapeutic value of this procedure and from their results we may conclude that the measure is a favorable one in some cases. Recently Karl Lexer has again brought this form of treatment into prominence by a report of four cases. He applied the ordinary methods used in producing an artificial pneumothorax, sterile nitrogen being used to compress the lung. Lexer's observations agree with those of others. The good effects on the patient were immediate, the temperature came down to normal, the expectoration lessened in amount and became thinner, elastic fibers and tubercle bacilli diminished in number or could no longer be found and the general condition improved. He believes that the good results justify further trials of this treatment with a hope of its becoming curative, especially since no harm can be done.

**New York Medical Journal.**—**HOMOGENIZED MILK:** Dr. Bernheim-Karrer of Zurich has recently reported some interesting data regarding homogenized milk. Milk, heated to from 131° to 149° F., is passed under high pressure between very rapidly moving plates thus combining intimately the fats with the general body of the milk. Under the microscope such milk appears to be uniformly impregnated with very small fat globules, which take the place of the much larger globules of different sizes found in the raw product. The milk is thus rendered not only easily digestible but also does not as quickly deteriorate as raw cow's milk. It also tastes better and cannot be skimmed by the middleman. —**GENERAL ANESTHESIA WITH SIMULTANEOUS ARTIFICIAL SEQUESTRATION OF A PORTION OF THE CIRCULATION:** Klapp has recently advocated, before giving a general anesthetic, the application centrally of bandages about the limbs so as to shut off the circulation in both artery and vein, whereby the

sequestration in the extremities of a large amount of blood uncontaminated by the anesthetic is accomplished. A much smaller quantity of anesthetic would then have to be used since only the blood contained in the head and trunk need be impregnated. The same procedure had been devised and employed by an American neurologist, Dr. J. Leonard Corning, 20 years ago. The method favors the quick emergence of the patient from the influence of the anesthetic after the removal of the bandages. It is a peculiar coincidence that the procedure and the arguments used to support it as put forth by Klapp are practically those advanced by Corning in his papers a score of years ago.

## NEWS AND NOTES.

**Second International Conference on the Sleeping-sickness.**—According to the *London Times*, the meeting which was to have assembled at the British foreign office on November 1, has been deferred in deference to the wishes of the German government, which has pointed out the advantage which would be gained if their delegates were in a position to submit to the conference the fruits of the recent labors of Professor Koch. Professor Koch has lately been engaged in an exhaustive inquiry into this question on the spot and has now returned to Berlin, where he is at present engaged in the preparation of his report. As this work must necessarily occupy a considerable time, the conference is unlikely to assemble before the middle of February. Meanwhile, however, meetings of the British delegates to the forthcoming conference are being held from time to time at the foreign office to consider various points connected with the work of the conference.

**Cornell University Medical College.**—The faculty of the Cornell University Medical College announces that in and after 1908 candidates for admission to the college must be (1) graduates of approved colleges or scientific schools; or (2) seniors in good standing in Cornell University or in any other approved college or scientific school whose faculty will permit them to substitute the first year of a professional course for the fourth year in arts and science, and which will confer upon them the bachelor's degree upon the satisfactory completion of the first year of the course in the Cornell University Medical College; or (3)

persons who, while not possessing a bachelor's degree, give evidence by examination that they have acquired an equivalent education and a training sufficient to enable them to profit by the instruction offered in the medical college. In and after 1909 all candidates for admission to the medical college must have at least such knowledge of physics and inorganic chemistry as may be obtained in college by a year's course in these subjects when accompanied by laboratory work. In and after 1910 all candidates for admission must possess a similar knowledge of biology.

**Opening of Massachusetts Hospital School for Crippled and Deformed Children.**—A portion of the building of the Massachusetts Hospital School for Crippled and Deformed Children at Canton was opened this week. It is estimated that the buildings will accommodate three hundred patients, and the effort will be made so to conduct their education that they later may become self-supporting. The location of the hospital, on the borders of the Blue Hill Reservation, is an exceptionally favorable one for its purpose. The superintendent is Dr. J. E. Fish, a graduate of the Dartmouth Medical School, and a man of experience in the administration of charities. Although the school is primarily a State charity, nevertheless the trustees, of whom Dr. Edward H. Bradford, professor of orthopedic surgery in the Harvard Medical School, is chairman, have power to admit paying patients. A chief aim of the institution, following modern philanthropic ideas, is to make the inmates, so far as possible, self-supporting.—*Boston Medical and Surgical Journal*.

**A cancer exhibition** will be held in Brussels in September, 1908, in connection with the Second International Surgical Congress. The exposition is to comprise exhibits of all sorts relative to the nature, occurrence, investigation, and treatment of malignant newgrowths.

**A Health Clearing House for Chicago.**—The Commissioner of Health in Chicago is seeking to establish what may be termed a health clearing house for Chicago and all its suburbs. In order to control as far as possible the sources and means of transmission of infectious diseases it is proposed that Chicago and all communities within a radius of fifty miles should cooperate in maintaining necessary laboratories and a smallpox hospital, in obtaining and publishing health data, in purchasing supplies, and in taking precautionary measures, ordinary and extraordinary, against the spread of diseases.—*Medical Record*.

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